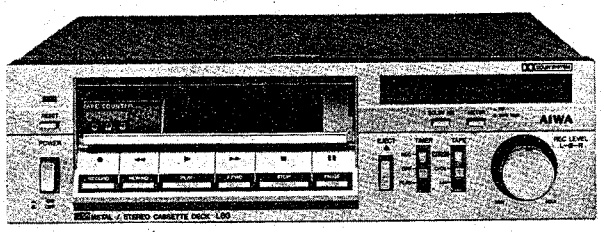
STEREO CASSETTE DECK

MODEL NO. SD-L60E,K

AIWA®

[SERVICE MANUAL]

Code No. 19-600-000-18



DATE OF ISSUE 6/1981

SPECIFICATIONS

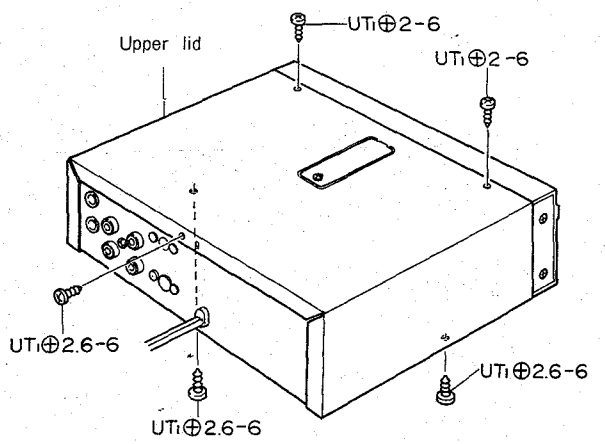
Semiconductors:	7 IC's, 48 transistors, 40 diodes, 14 LED's
Power supply:	E model AC 220V 50/60 Hz K model AC 240V 50/60 Hz
Power consumption:	18W
Dimensions:	250(W) x 71(H) x 253(D)mm
Weight:	3.4 kg
Track type:	4 tracks 2 channel
Tape speed:	4.8 cm/s.
Wow and flutter:	Less than 0.06% (WRMS)
Automatic stop system:	Full auto stop
Automatic shut-off action time:	$3\ ^{+2}_{-1}$ s.
Pinch roller pressure:	350 ± 50 g(3.43 ± 0.5 N)
Take-up torque:	$50\ ^{+15}_{-10}$ g-cm ($0.49\ ^{+0.2}_{-0.1}$ mN·m)
FF & rewind torque:	$110\ ^{+50}_{-20}$ g-cm ($1.078\ ^{+0.5}_{-0.2}$ mN·m)
FF & rewind time:	$90\ ^{+10}_{-5}$ s.
Playback output: (TTA-161)	0.58 ± 0.05V (LINE)
Playback noise: (Unweighted)	Less than 1.5 mV (DOLBY NR ON)
Rec./PB output:	0 VU ± 1.5 dB (LINE)
Rec./Pb distortion:	Less than 2.5% (CrO_2) Less than 1.5% (METAL) Less than 1.5% (LH)
Rec./Pb SN ratio: (1 kHz, Unweighted)	More than 45/45 dB (CrO_2, METAL, DOLBY NR OFF/ON) More than 42/43 dB (LH, DOLBY NR OFF/ON)
Channel separation: (1 kHz, 0 VU)	More than 25 dB
Cross talk: (1 kHz, 0 VU)	More than 60 dB
Erasing ratio: (125 Hz, 0 VU, +10 dB)	More than 55 dB
Bias frequency:	85 kHz
Frequency response:	METAL 25 ~ 16,000 Hz CrO_2 25 ~ 16,000 Hz LH 25 ~ 14,000 Hz
Motor:	DC servo motor
Inputs:	MIC max. sensitivity 0.5 mV (200 Ω ~ 10 kΩ suitable) LINE IN max. sensitivity 50 mV (Optimum load impedance more than 50 kΩ)
Outputs:	LINE OUT Standard level 0.41V (0 VU) (Optimum load impedance more than 50 kΩ) PHONES 8Ω

- Specifications and external appearance are subject to change without due to product improvement.
- Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
- Dolby and the ⊡⊡ symbol are trademarks of Dolby Laboratories Licensing Corporation.

DISASSEMBLY INSTRUCTIONS

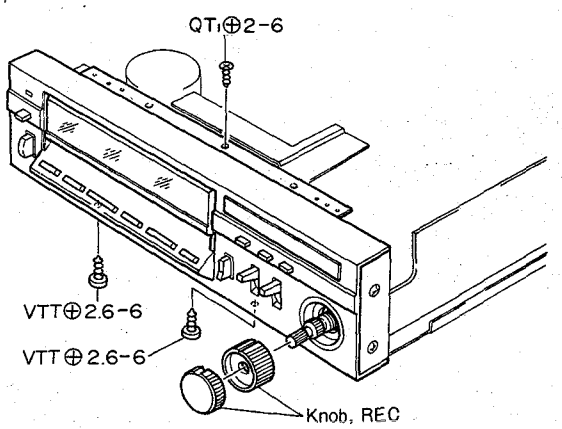
1. Removing the upper lid

1) Remove 5 screws.



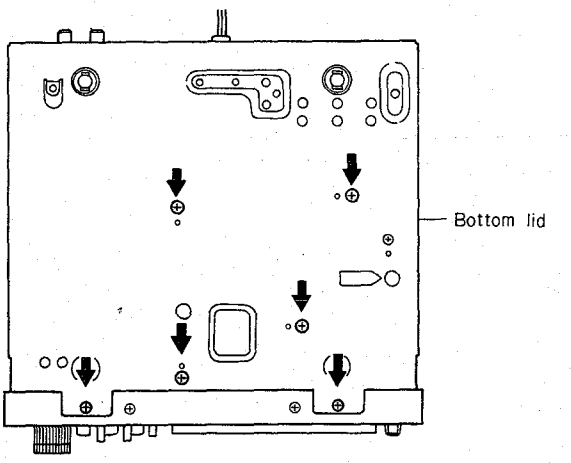
2. Removing the front panel

1) Remove the REC knob and 3 screws.

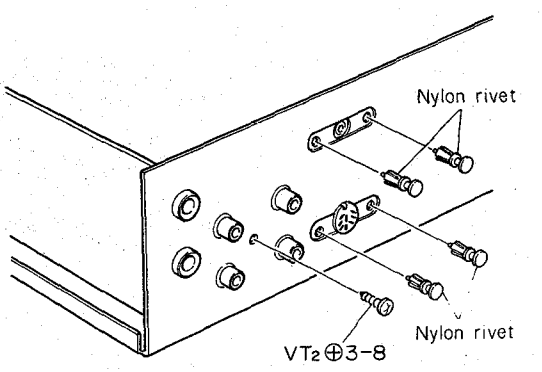


3. Removing the bottom lid

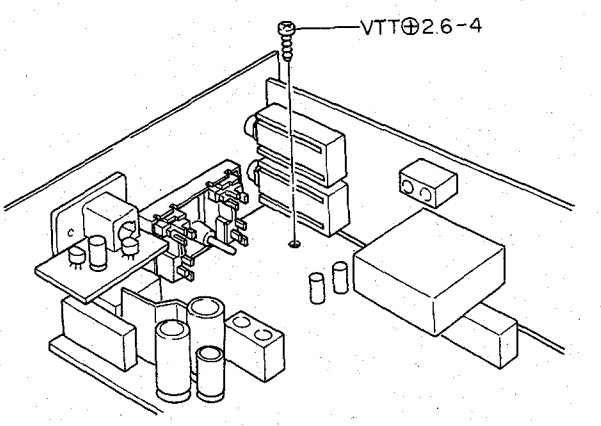
1) Remove 6 screws.



2) Remove the screw and 4 nylon rivets on the jack side.

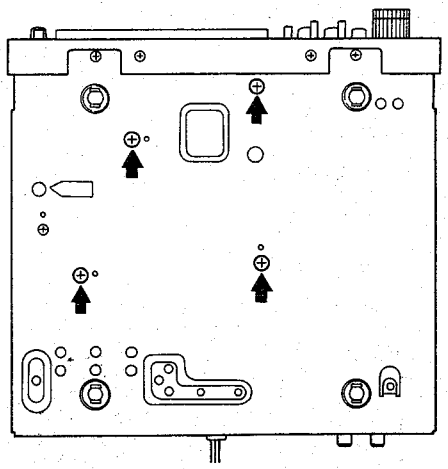


3) Remove 1 screw of the main PC Board.

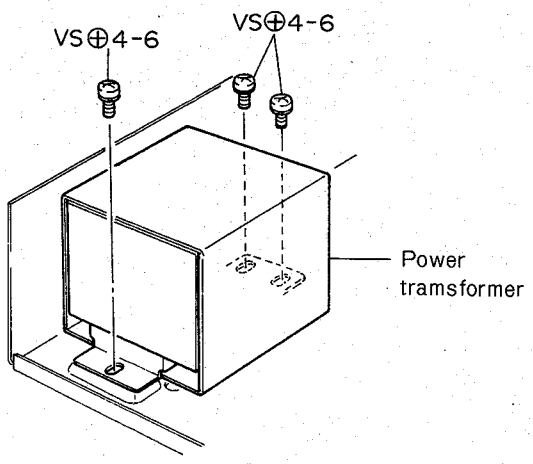


4. Removing the mechanism ass'y

1) Remove 4 screws.

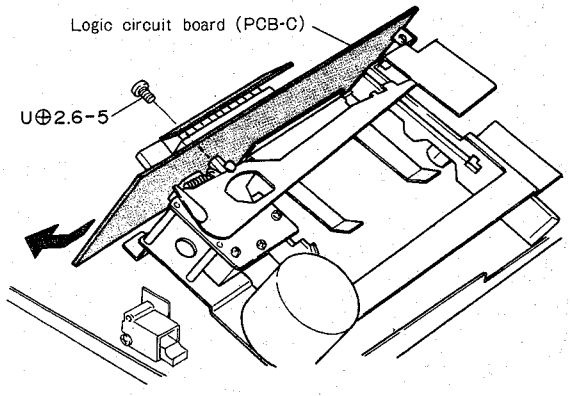


2) Remove 3 screws and then remove the power transformer.



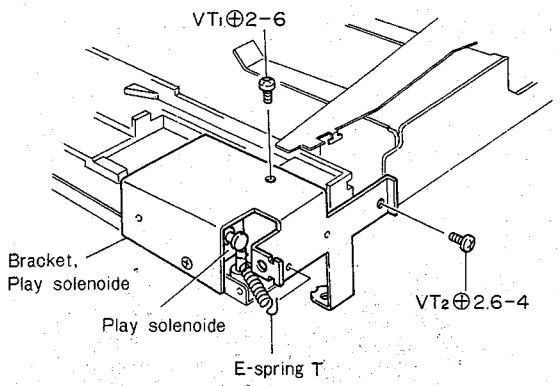
3) Lift up the rear of the mechanism, remove the screw of the logic PC Board, slide the PC Board to the left and remove the PC board.

Note: Checking the PC Board and the mechanism is possible in the condition in item 3) above.

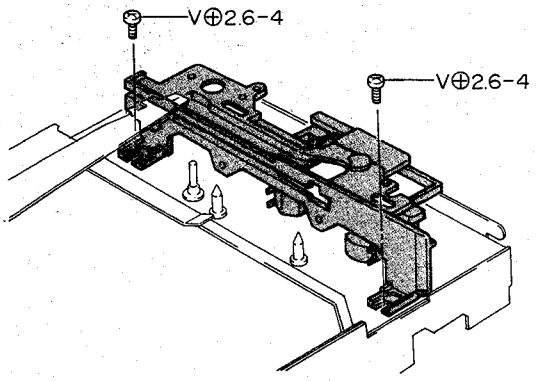


5. Removing the head bracket

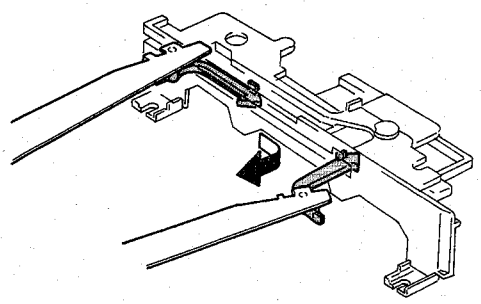
1) Remove 2 screws of the play solenoid bracket and E-spring.



2) Remove 2 screws of the slider housing.



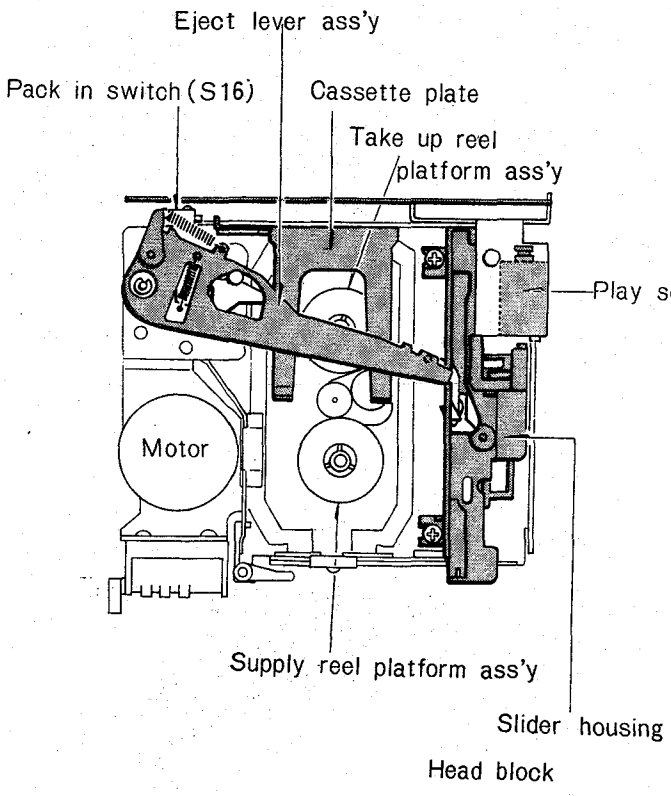
3) Remove the cassette slider from the slider housing.



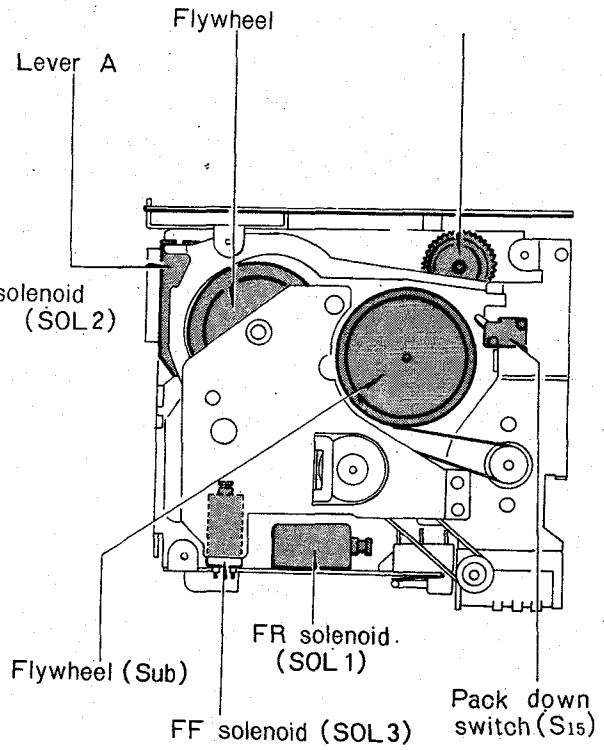
DESCRIPTION OF OPERATION OF MECHANISM

NAME OF PARTS

FRONT SIDE OF MECHANISM CHASSIS



REAR SIDE OF MECHANISM CHASSIS

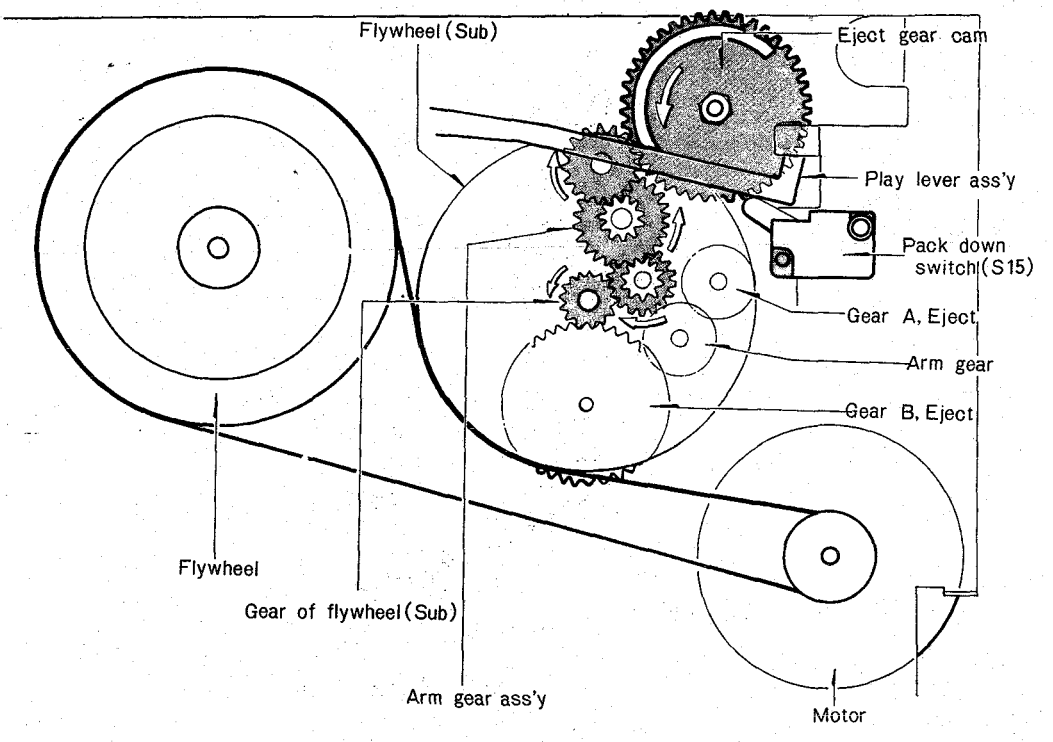


AUTO-LOADING

Auto-loading is performed in the following way: The motor rotation is transmitted to all the gears from the flywheel (sub), and the eject gear cam is rotated to move the lever eject.
The rotation direction of each gear is different during auto-loading and during eject, so see the diagram below.

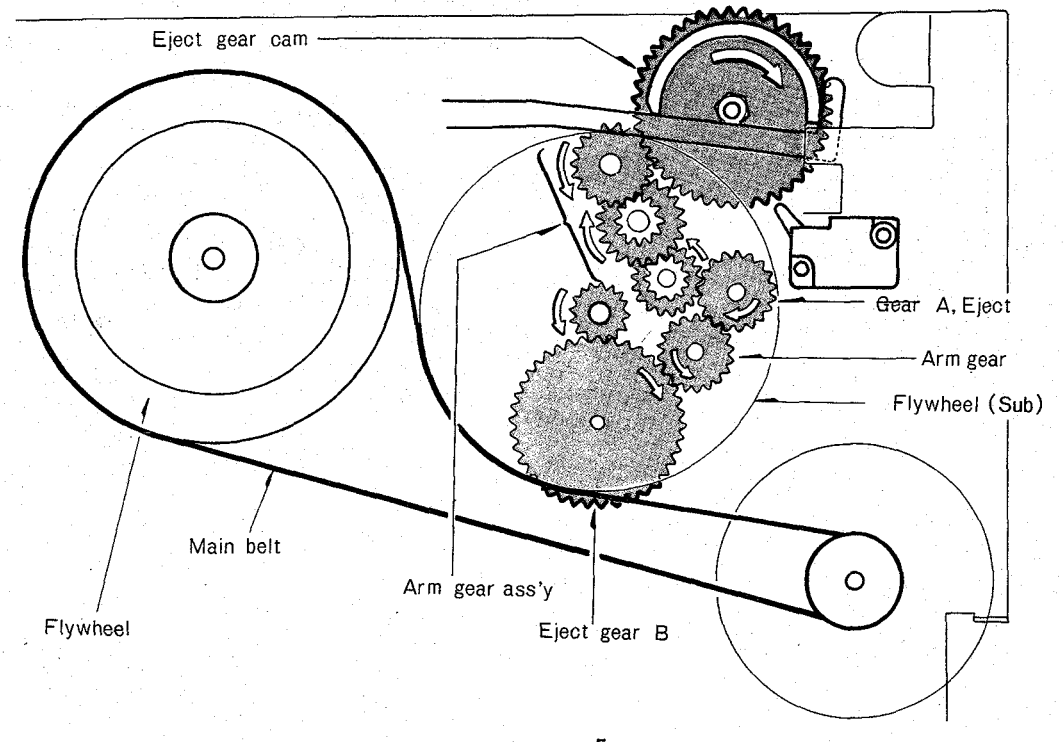
TURNING DIRECTION OF EACH GEAR FOR EJECT.

REAR SIDE OF MECHANISM CHASSIS



TURNING DIRECTION OF EACH GEAR FOR AUTO-LOADING.

REAR SIDE OF MECHANISM CHASSIS



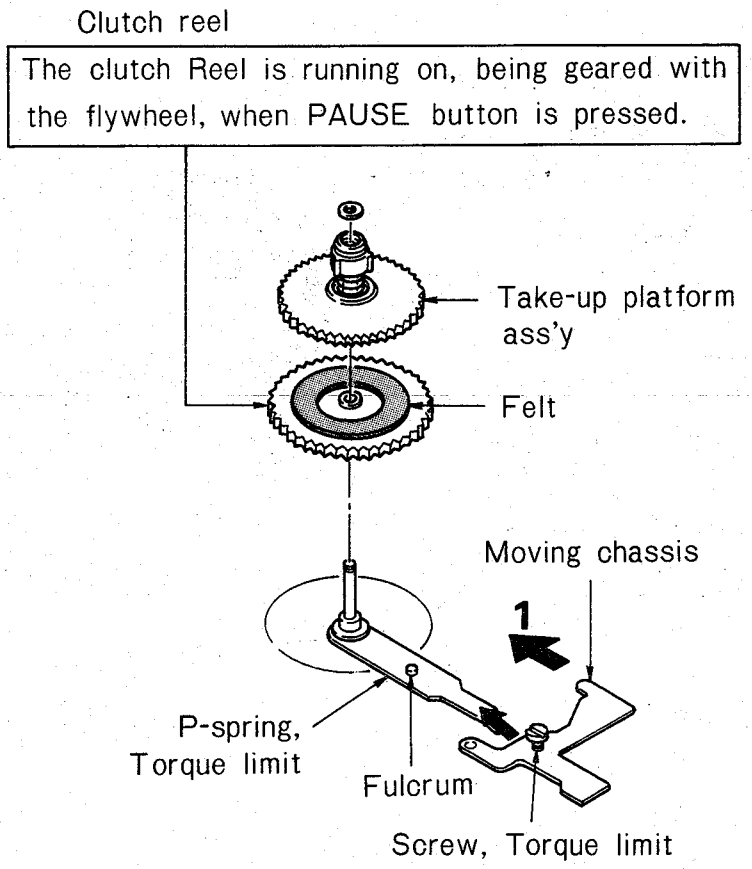
DESCRIPTION OF THE TAKE-UP REEL PLATFORM ASS'Y REVOLUTION TRANSMISSION

- **During PLAY mode**

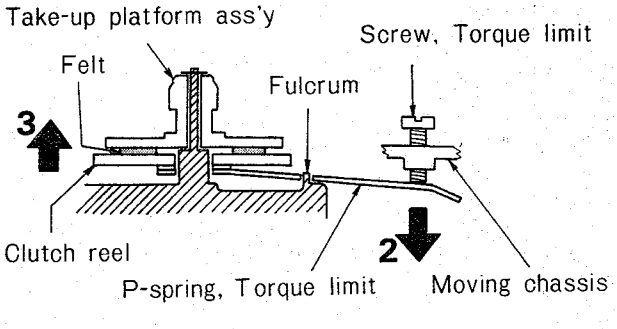
The torque limit screw of the movable chassis depresses the P-spring torque downward in the direction ↓ (2) by means of the movement of the movable chassis in the direction ← (1) during PLAY, so the clutch reel is pressed in the direction ↑ (3) and compressed against the Take-up reel platform ass'y and the Take-up reel platform ass'y rotates.

- **During PAUSE mode**

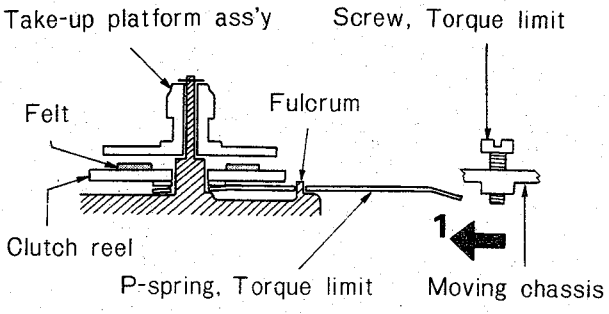
Compression between the clutch reel and the Take-up reel platform ass'y is weak during the PAUSE mode, so the Take-up reel platform ass'y stops rotating.



During Play

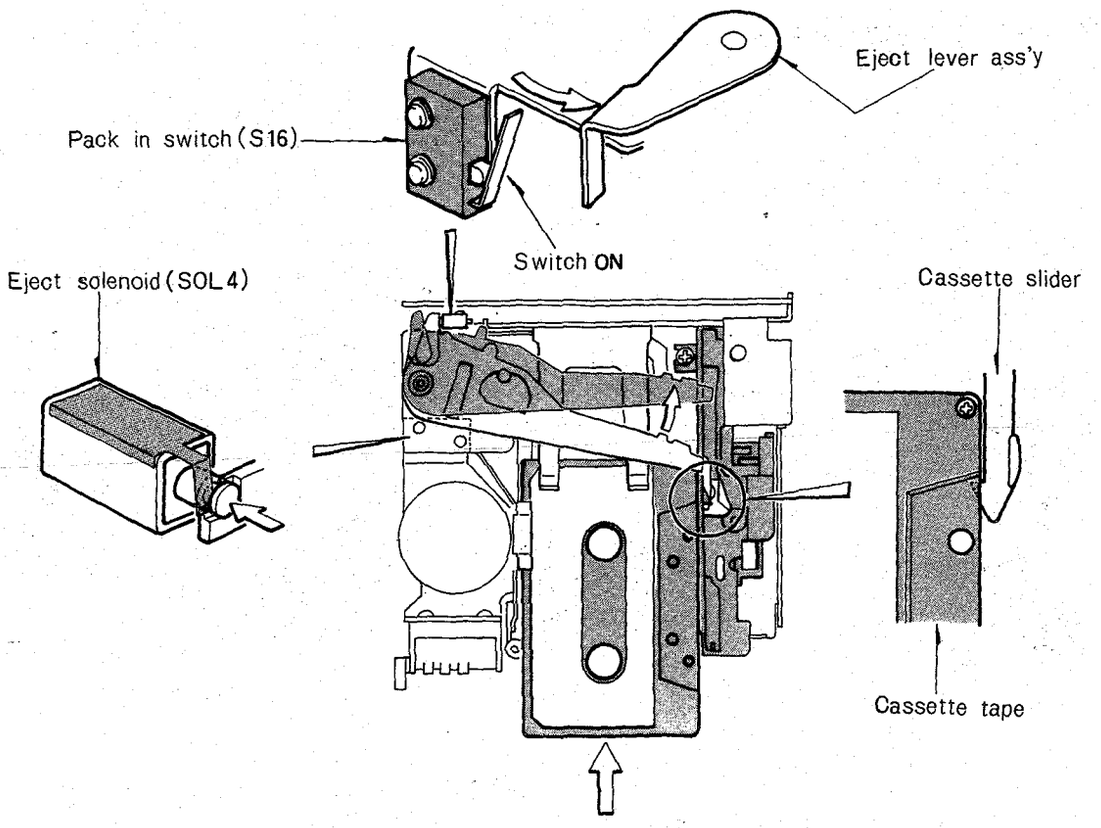


During Pause



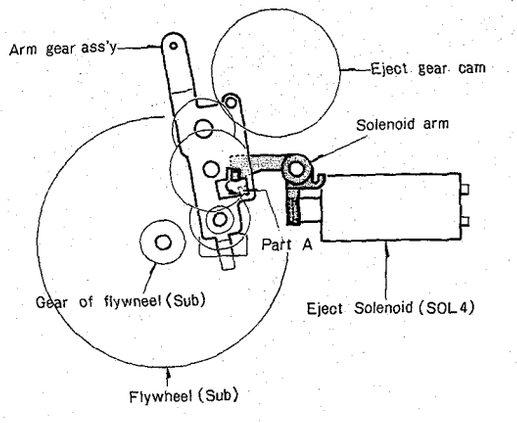
AUTO-LOADING operation

1. When the cassette is inserted and the cassette tape is engaged with the cassette slider, the lever eject is pressed, the LOADING microswitch (Pack-in switch S16) is set to "ON", the eject solenoid (SOL4) operates and the motor starts rotating.

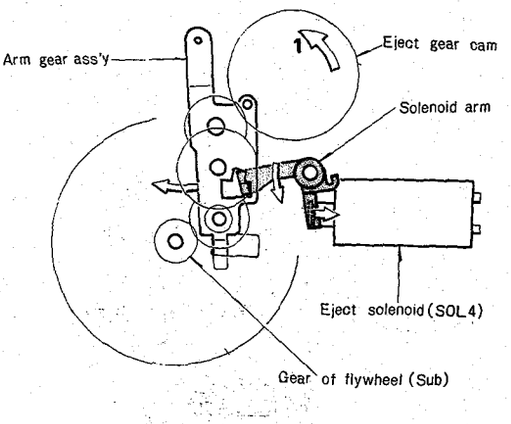


2. When the eject solenoid (SOL4) operates, the solenoid arm moves to section (A), the arm gear ass'y engages with the gear of the flywheel (sub) and the eject gear cam rotates in the direction ↶ (1)

REAR SIDE OF MECHANISM CHASSIS

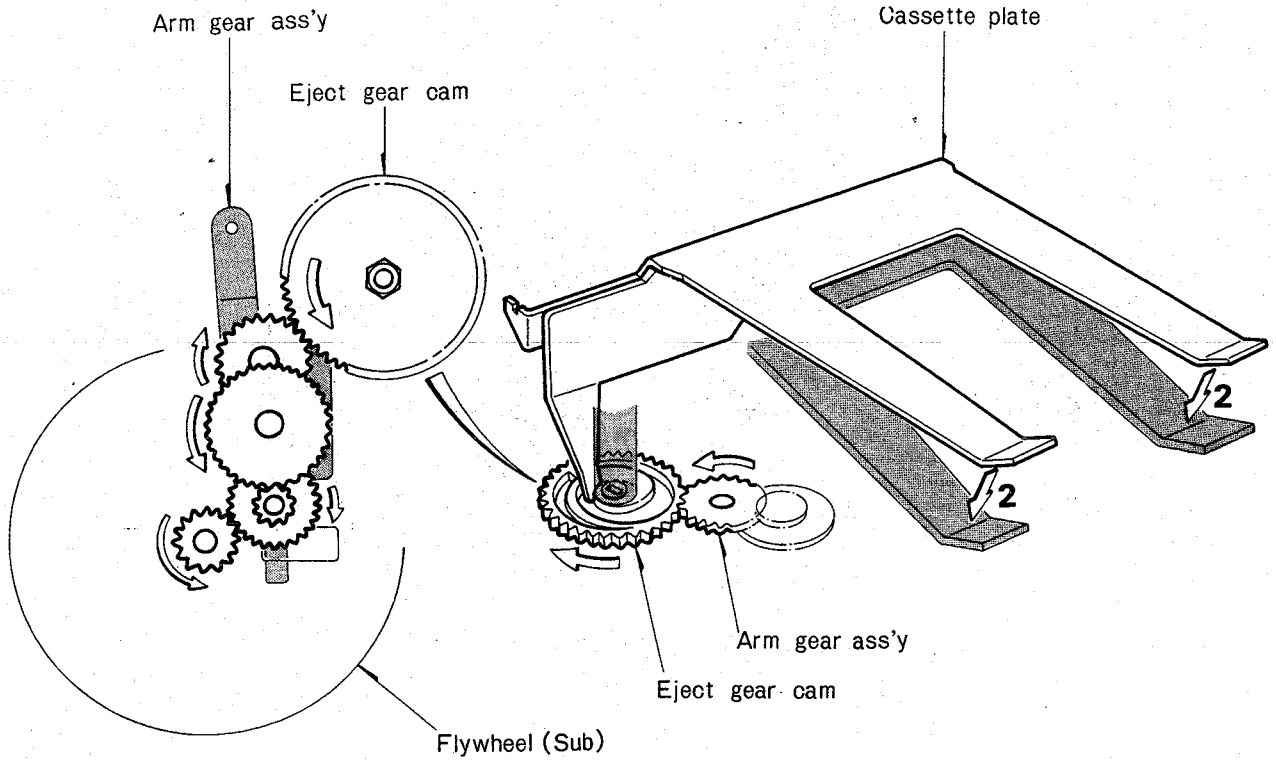


REAR SIDE OF MECHANISM CHASSIS

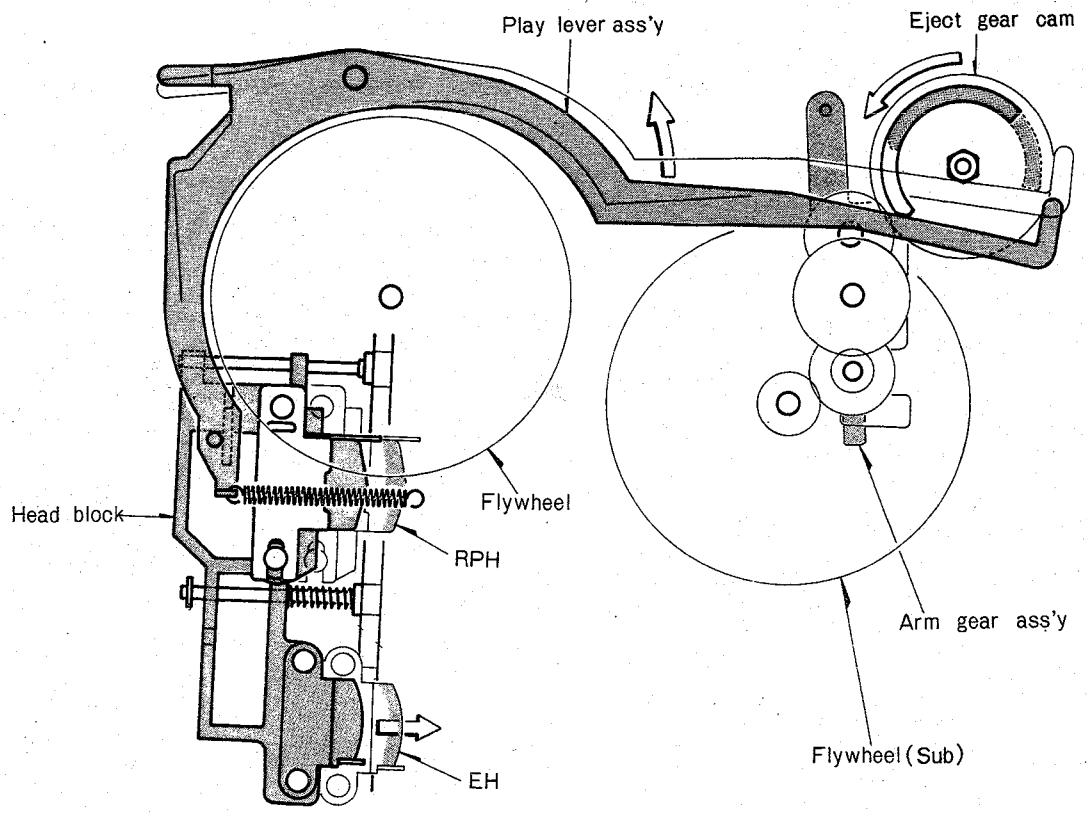


3. When the eject lever cam rotates, the cassette plate moves in the direction of ↓ (2) along the cam and depress the cassette plate. The play lever which keeps in contact with the eject gear cam operates simultaneously at this time and the head block also comes out to the front.

FRONT SIDE OF MECHANISM CHASSIS

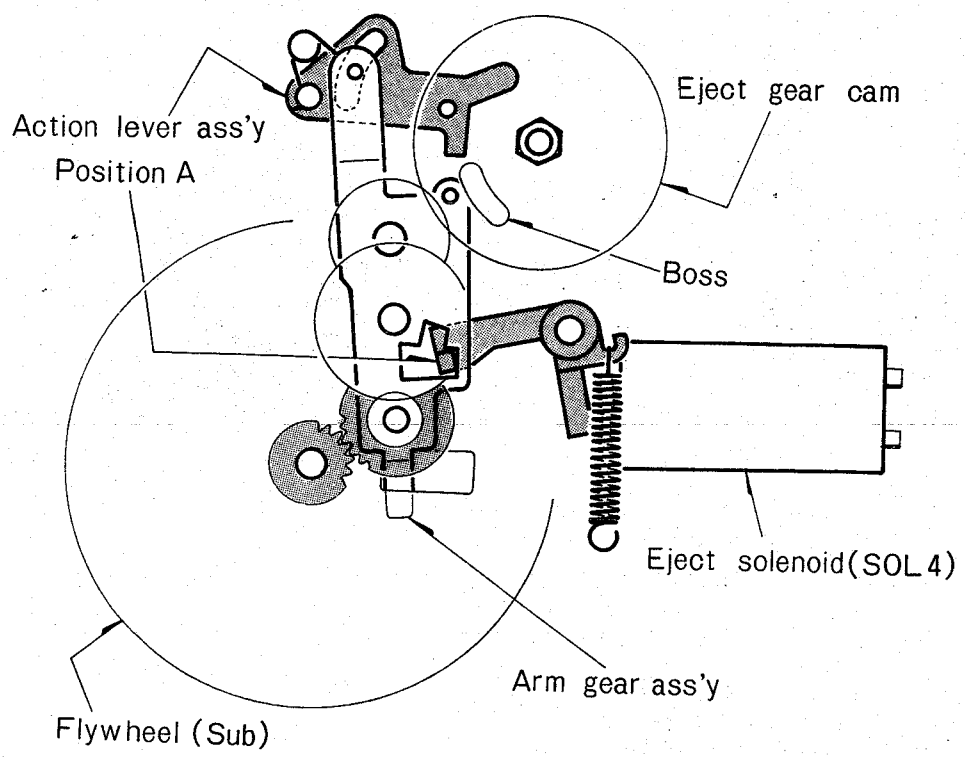


REAR SIDE OF MECHANISM CHASSIS

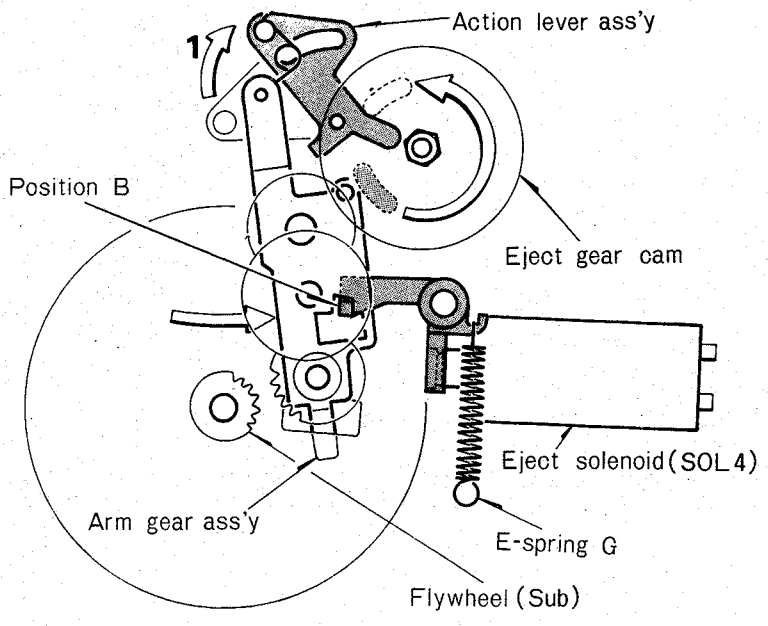


4. Simultaneously with the operations in term 3), the boss of the eject gear cam moves the action lever ass'y in the direction ↗(1), and moves the arm gear ass'y from position A to position B. This causes roatation from the flywheel (sub) to be released. The solenoid arm returns to section B at this time.

REAR SIDE OF MECHANISM CHASSIS



REAR SIDE OF MECHANISM CHASSIS

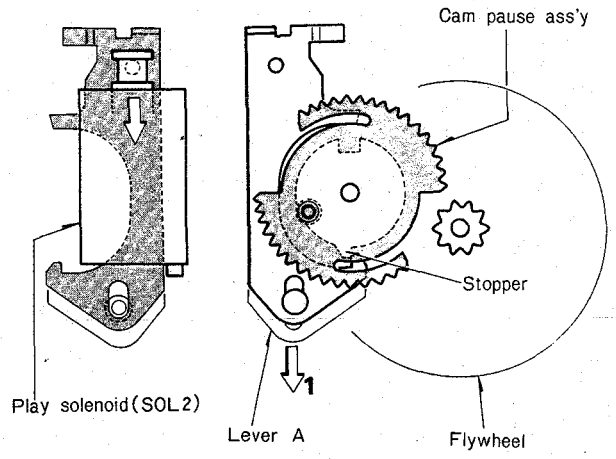


PLAY operation

1. With the PLAY button pressed, the PLAY solenoid operates, the interlocked lever A moves in the direction ↓ (1) to release the stopper of the cam pause ass'y.

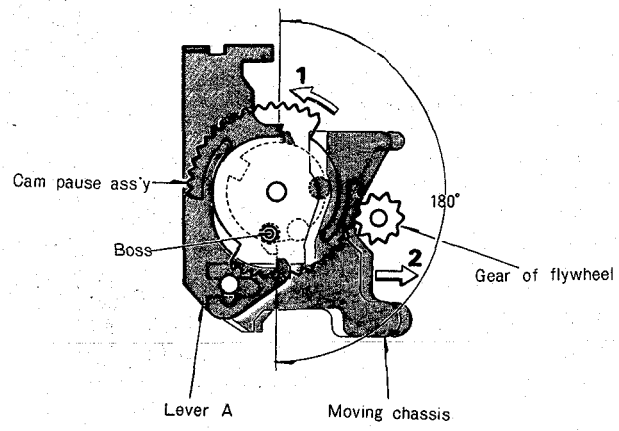
FRONT SIDE OF MECHANISM CHASSIS

REAR SIDE OF MECHANISM CHASSIS



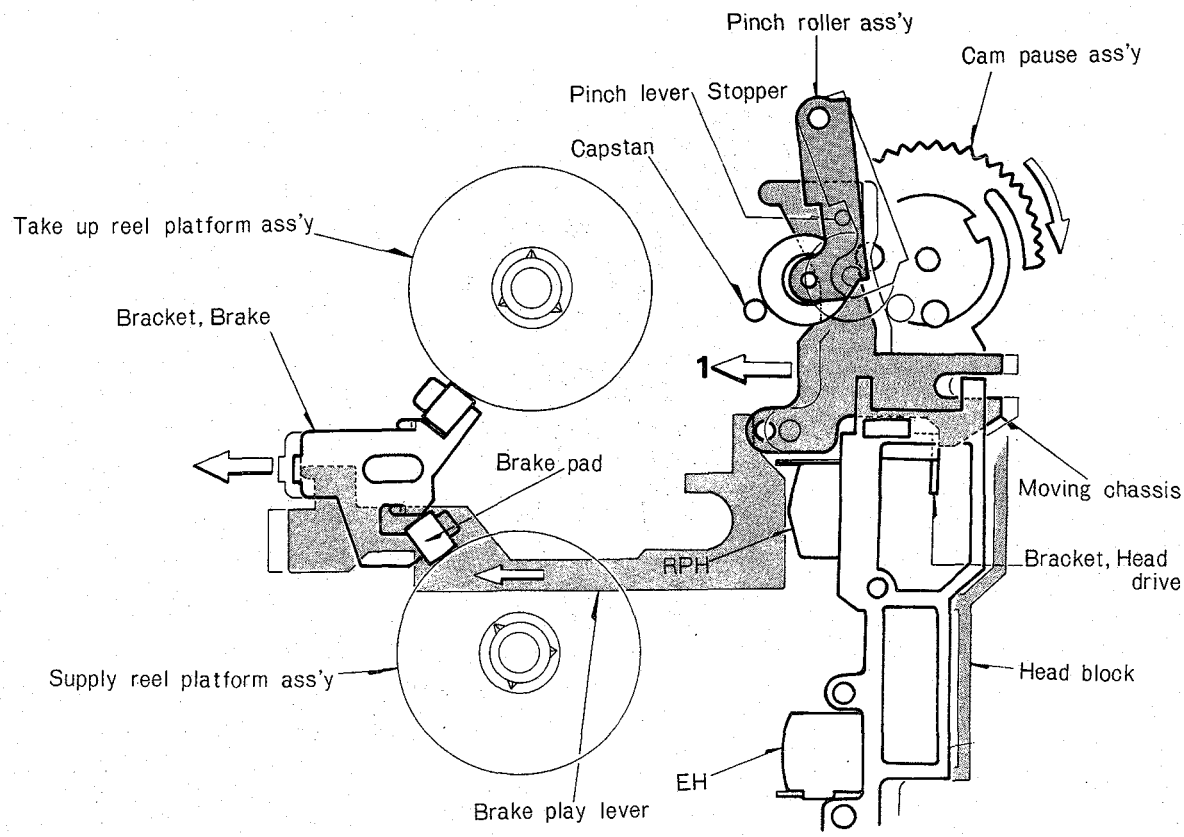
2. With the stopper released, the gear of the cam pause ass'y engages with the gear of flywheel, turns in the direction ↶(1) and the boss of the cam pause ass'y rotates 180° while pressing the movable chassis in the direction → (2), touching lever A when rotation stops.

REAR SIDE OF MECHANISM CHASSIS



3. The movable chassis moves in the direction ← (1), the pinch lever stopper moves toward the tape, the pinch lever is compressed against the capstan and the movable chassis releases braking. At the same time, the head block comes to the front while pressing the head drive bracket and the unit enters the PLAY mode.

FRONT SIDE OF MECHANISM CHASSIS



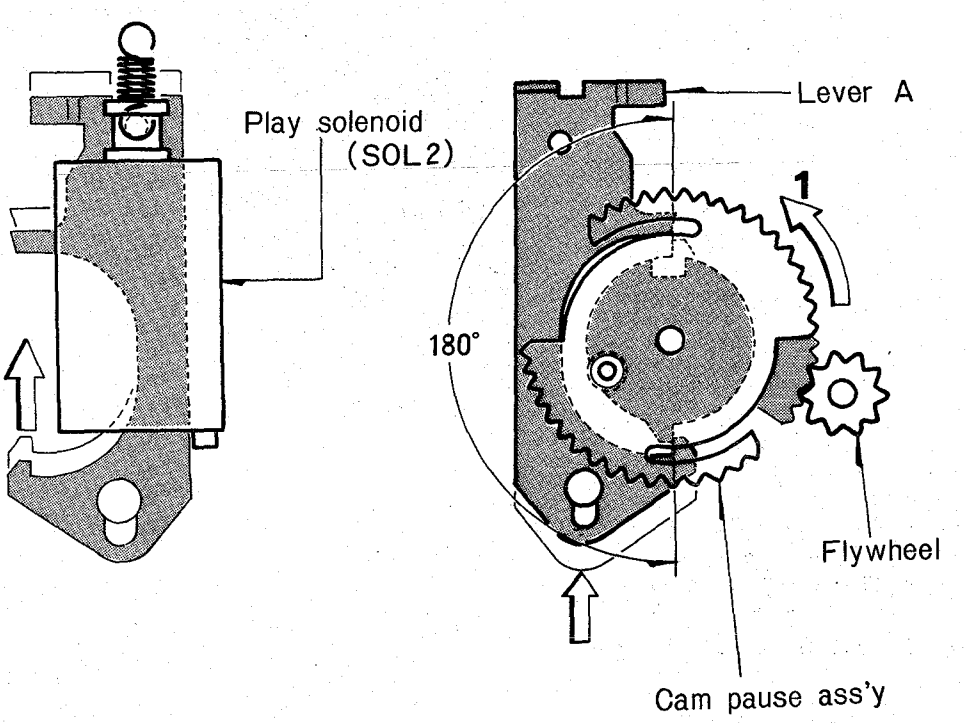
STOP operation

1. With the PAUSE button pressed, the PLAY solenoid (SOL2) is released, and lever A is pulled by the spring and returns to its original position.
2. Simultaneously, when lever A returns, the stopper of the cam pause ass'y is released from lever A, the gear of the cam pause engages with the flywheel gear and touches the lever A at the position where it turns 180° in the direction ↶(1). Rotation stops at this time and unit enters the STOP mode.

Note: PAUSE operation is same as STOP operation.

FRONT SIDE OF MECHANISM CHASSIS

REAR SIDE OF MECHANISM CHASSIS

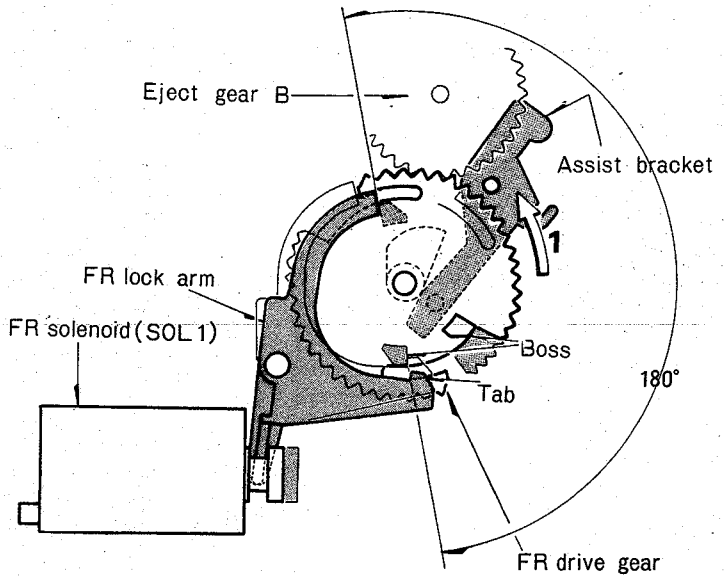


REW operation

1. With the REW button pressed, the FR solenoid (SOL1) operates and the tab of the FR lock arm releases the boss of the FR drive gear. The FR drive gear has been pressed by the assist-bracket at that time, so the FR drive gear engages with the eject gear B and turns 180° in the direction ↖ (1), the boss of the drive gear touches the FR lock arm to stop rotation.

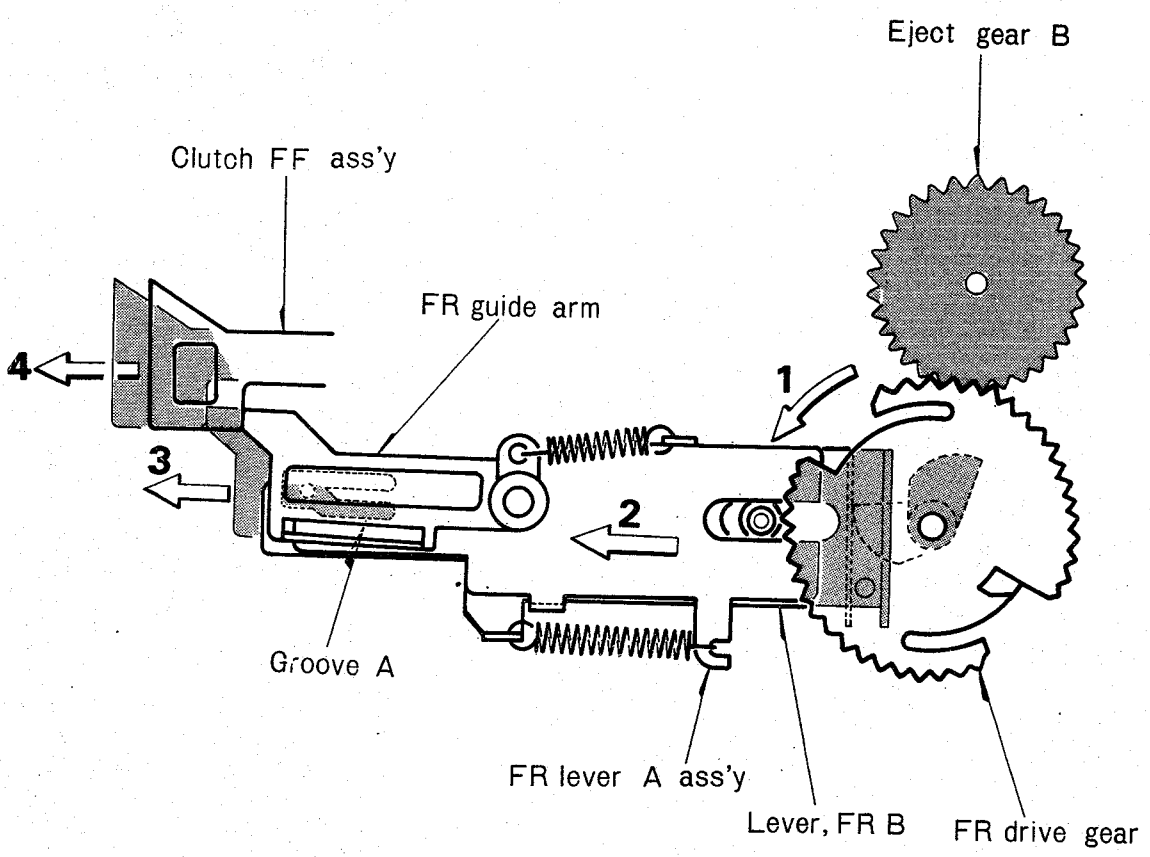
2. With the drive gear turned in the direction ↓ (1), the cam of drive gear presses the lever FR-A ass'y and lever FR-B and moves in the direction ← (2).

REAR SIDE OF MECHANISM CHASSIS



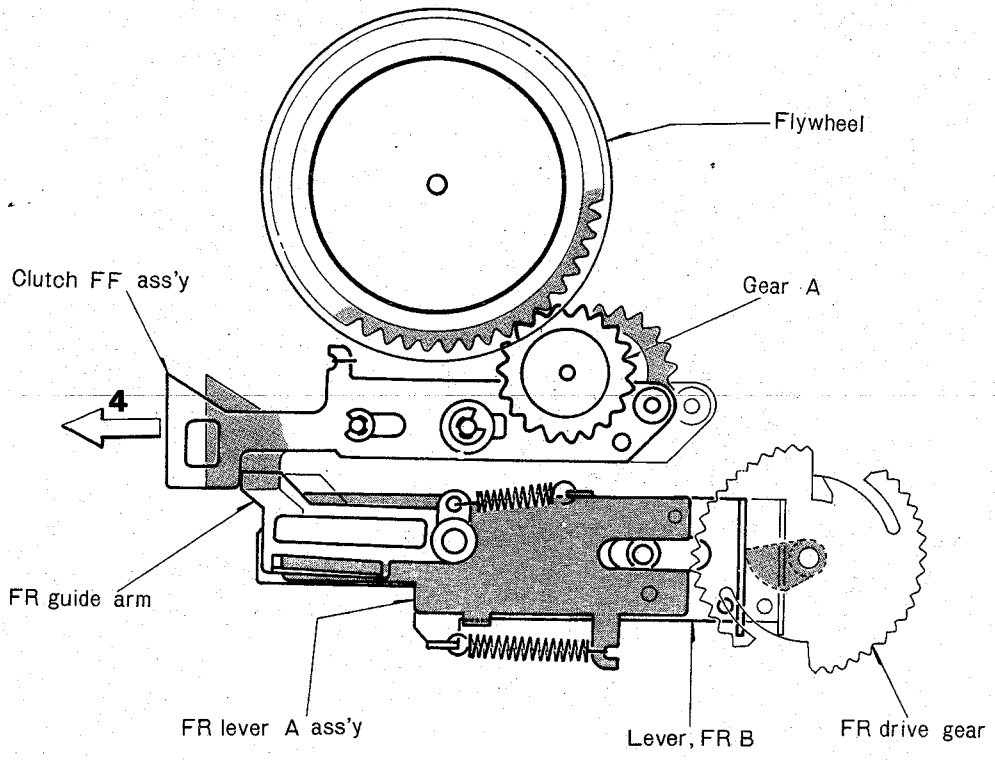
3. With the lever FR-A ass'y and lever B moved in the direction ← (2), the boss of the chassis enters the groove A of the FR guide arm to move the FR guide arm in the direction ← (3) and presses the clutch FF in the direction ← (4).

FRONT SIDE OF MECHANISM CHASSIS

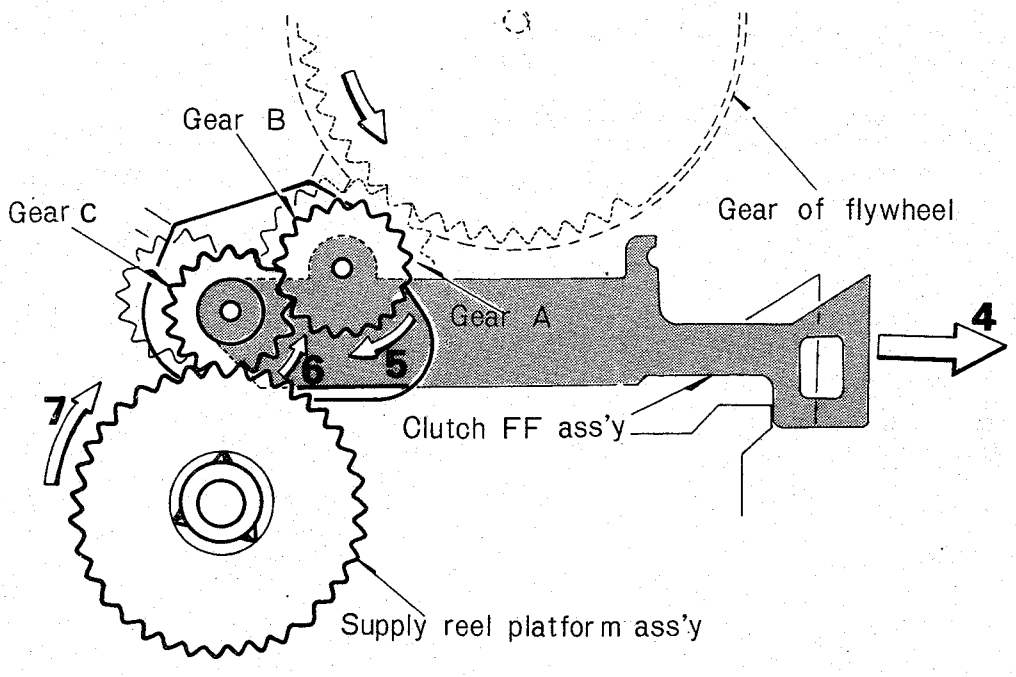


4. With clutch FF pressed in the direction ← (4), gear A engages with the flywheel gear, gear B and gear C rotate in directions ↻ (5) and ↺ (6) respectively to turn the Supply reel platform ass'y in the direction ↻ (7) to perform the REW operation.

REAR SIDE OF MECHANISM CHASSIS



FRONT SIDE OF MECHANISM CHASSIS

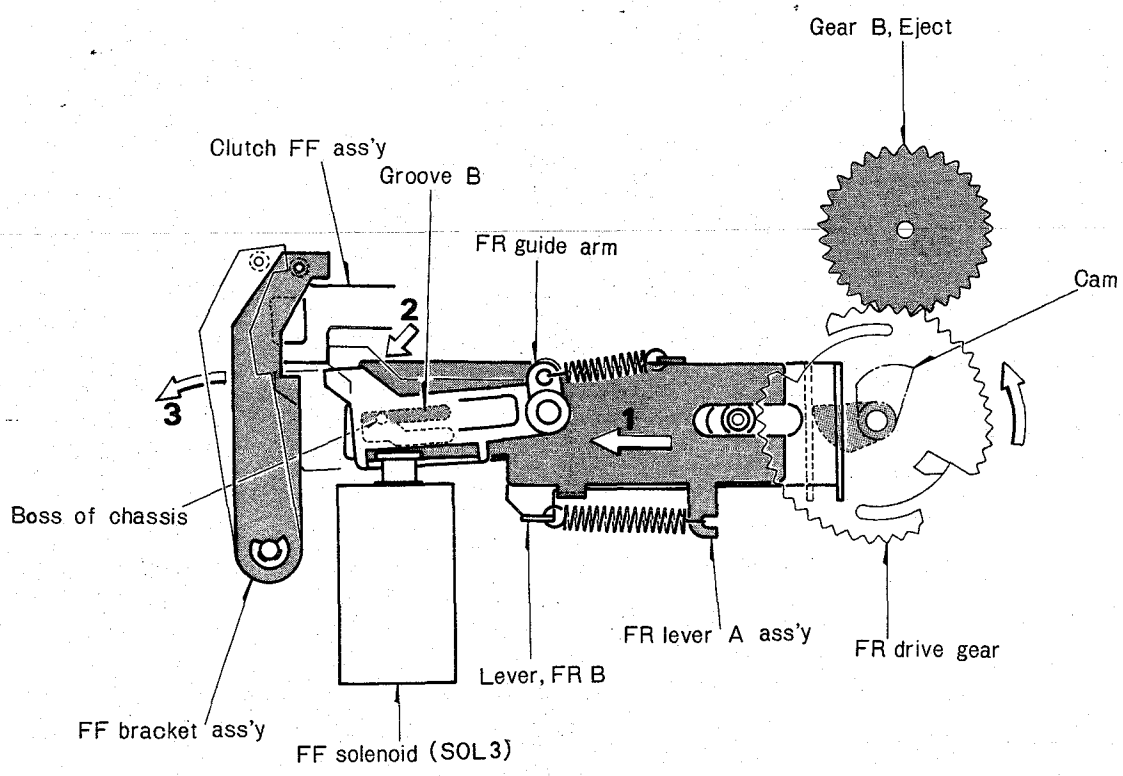


FF operation

1. When the FF button is pressed, the FF solenoid (SOL3) and FR solenoid (SOL1) operate. The FR drive gear operates the same as in the REW mode at this time.

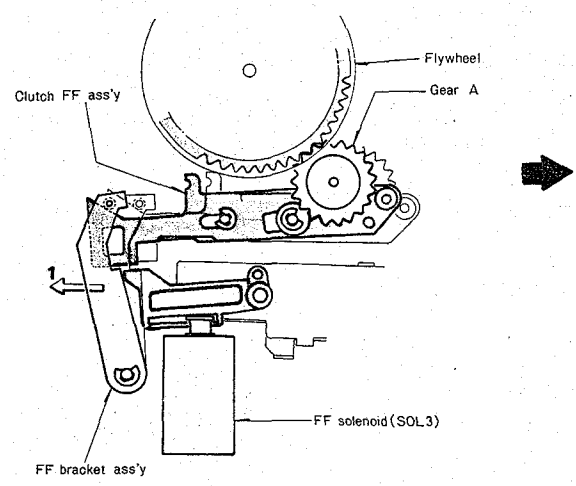
3. When the FF bracket is pressed in the direction ← (1), the clutch FF gear A engages with the flywheel gear to turn gear B in the direction ↻(2), turns the Take-up reel platform ass'y in the direction ↻ (3) to perform the FF operation.

REAR SIDE OF MECHANISM CHASSIS

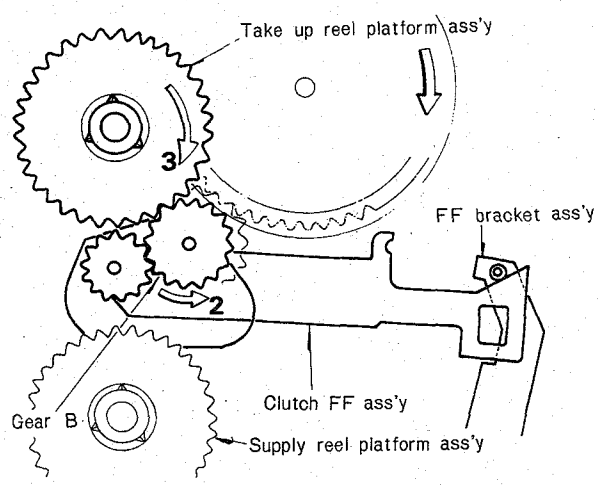


2. When lever FR-A ass'y and lever B move in the direction ← (1), the FR guide arm is pulled by the FF solenoid (SOL3), and the boss of the chassis enters groove B of the FR guide arm to pull the FR guide arm in the direction ↙ (2) and presses the FF bracket in the direction ↙ (3).

FRONT SIDE OF MECHANISM CHASSIS



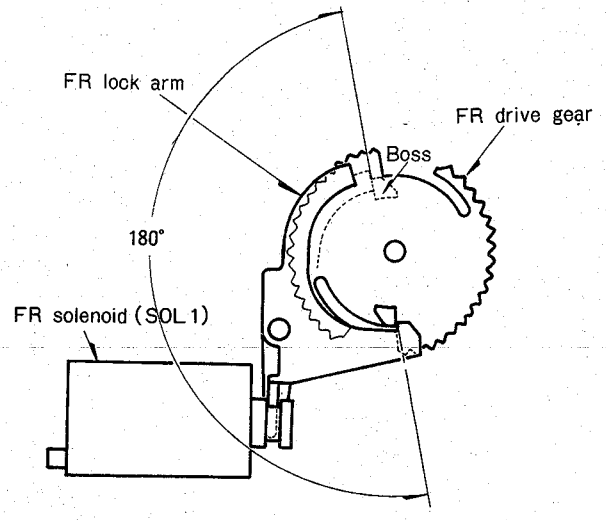
REAR SIDE OF MECHANISM CHASSIS



STOP operation

With the STOP button pressed, the FR solenoid (SOL1) is released and the FR lock arm releases the boss of the drive gear, so the drive gear turns 180°, the boss touches the tab of the FR lock arm to stop rotation and the FF/REW operation is released.

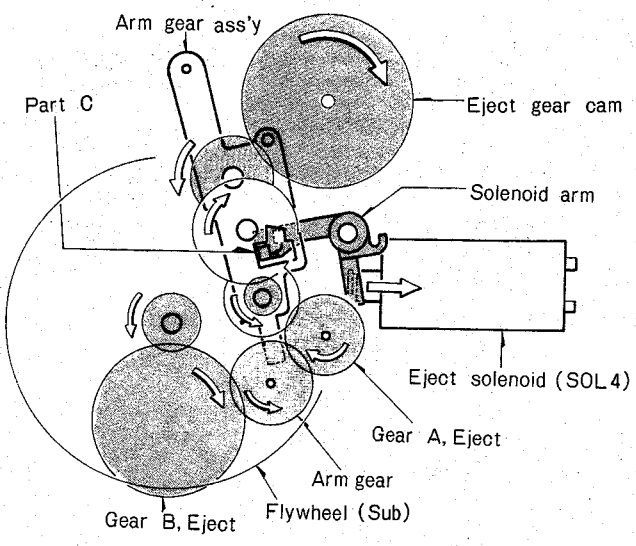
REAR SIDE OF MECHANISM CHASSIS



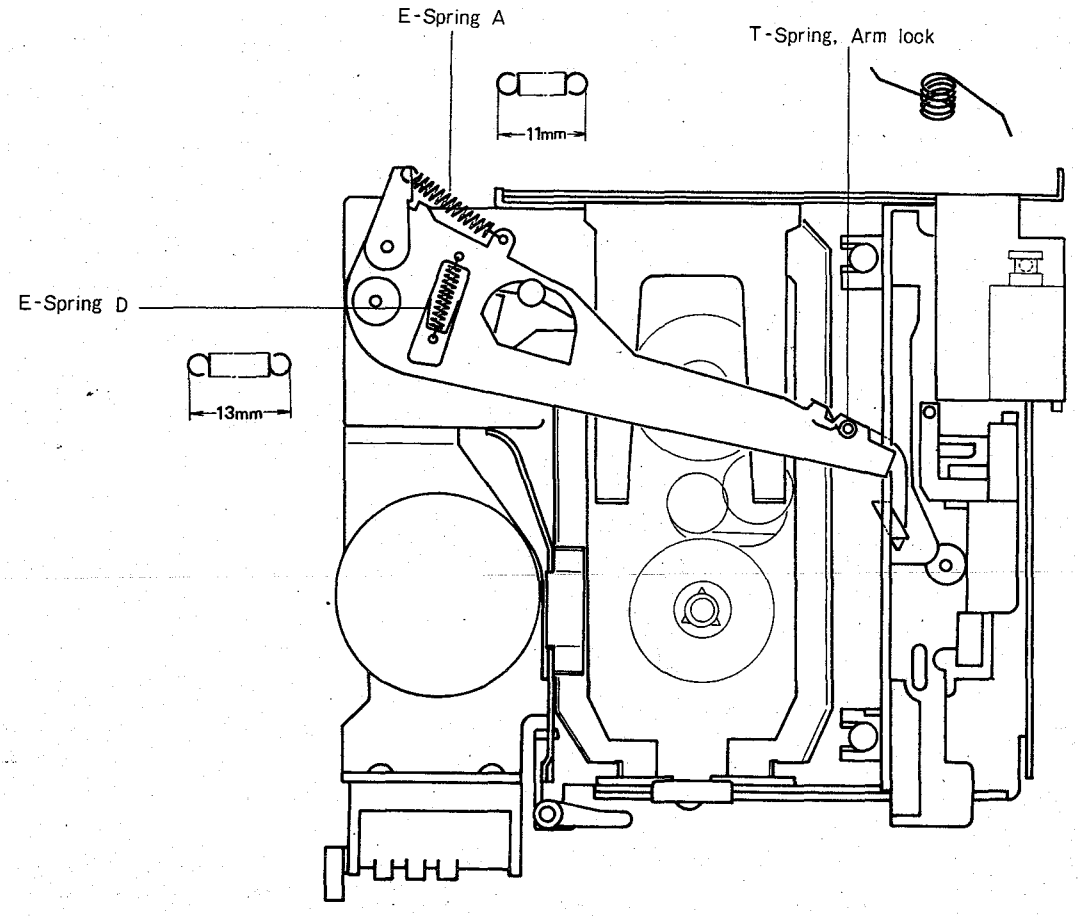
EJECT operation

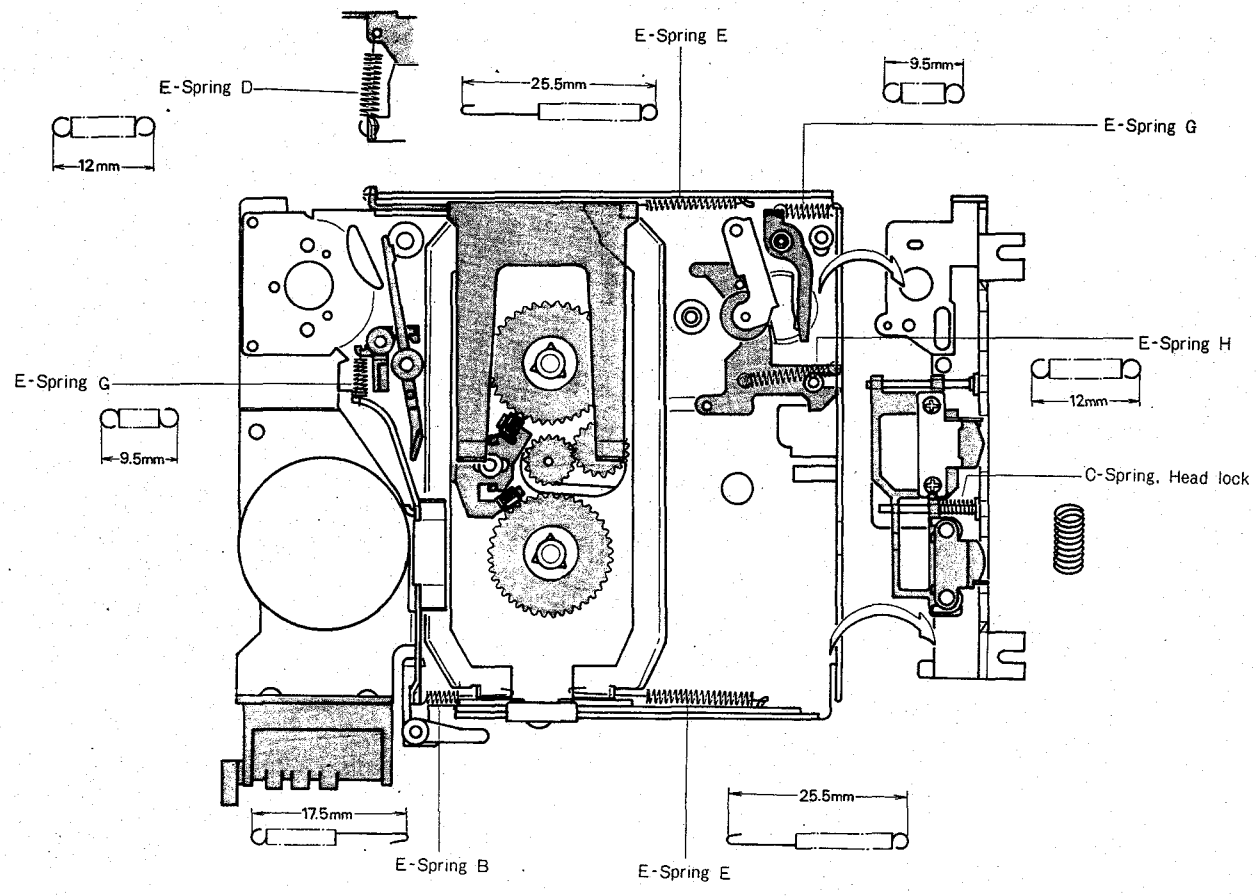
1. With the EJECT button pressed, the eject solenoid (SOL4) operates and the solenoid arm moves to section C.
   Then the arm gear ass'y engages with the eject gear A and turns.
2. The arm gear ass'y turns in the opposite direction to that during loading and the eject gear arm turns counterclockwise.
3. When the eject gear cam turns in the direction reverse to that during loading, the PLAY lever operates, the head block returns, the cassette plate lifts up and the lever eject pushes out the cassette.

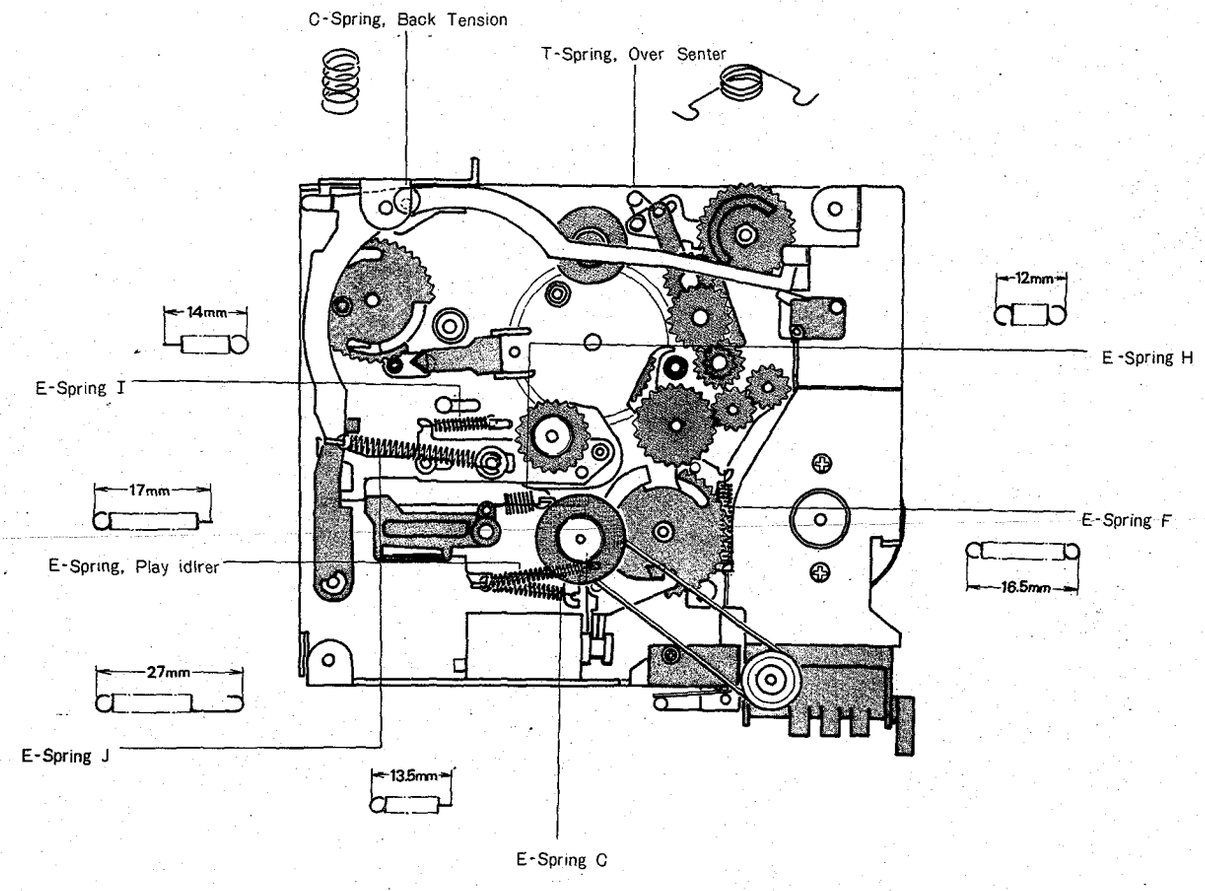
REAR SIDE OF MECHANISM CHASSIS



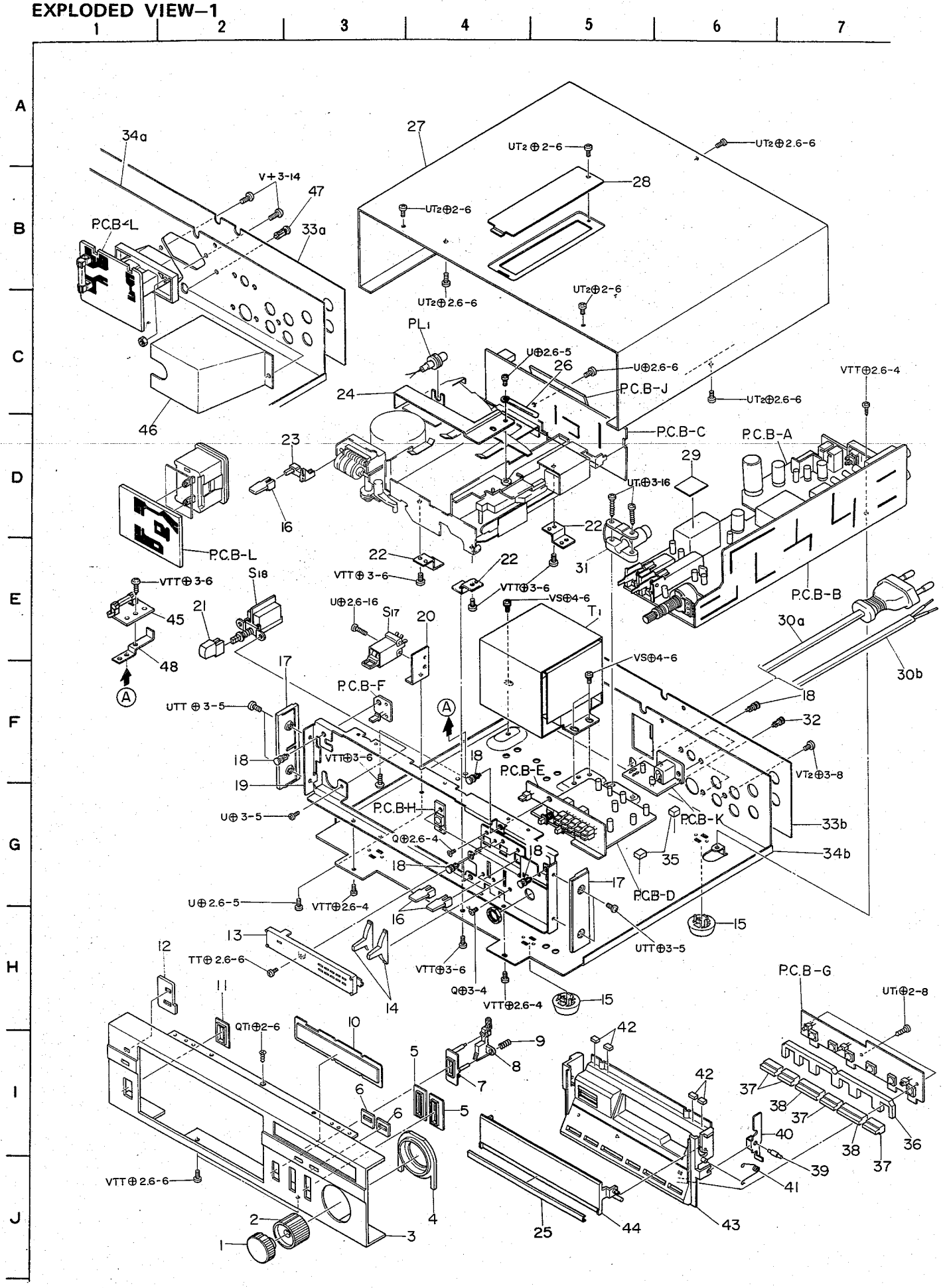
SPRING APPLICATION POSITION






C-Spring, Back Tension
T-Spring, Over Senter
14mm
E-Spring I
12mm
E-Spring H
17mm
E-Spring, Play idlrer
E-Spring F
16.5mm
27mm
E-Spring J
13.5mm
E-Spring C

EXPLODED VIEW—1



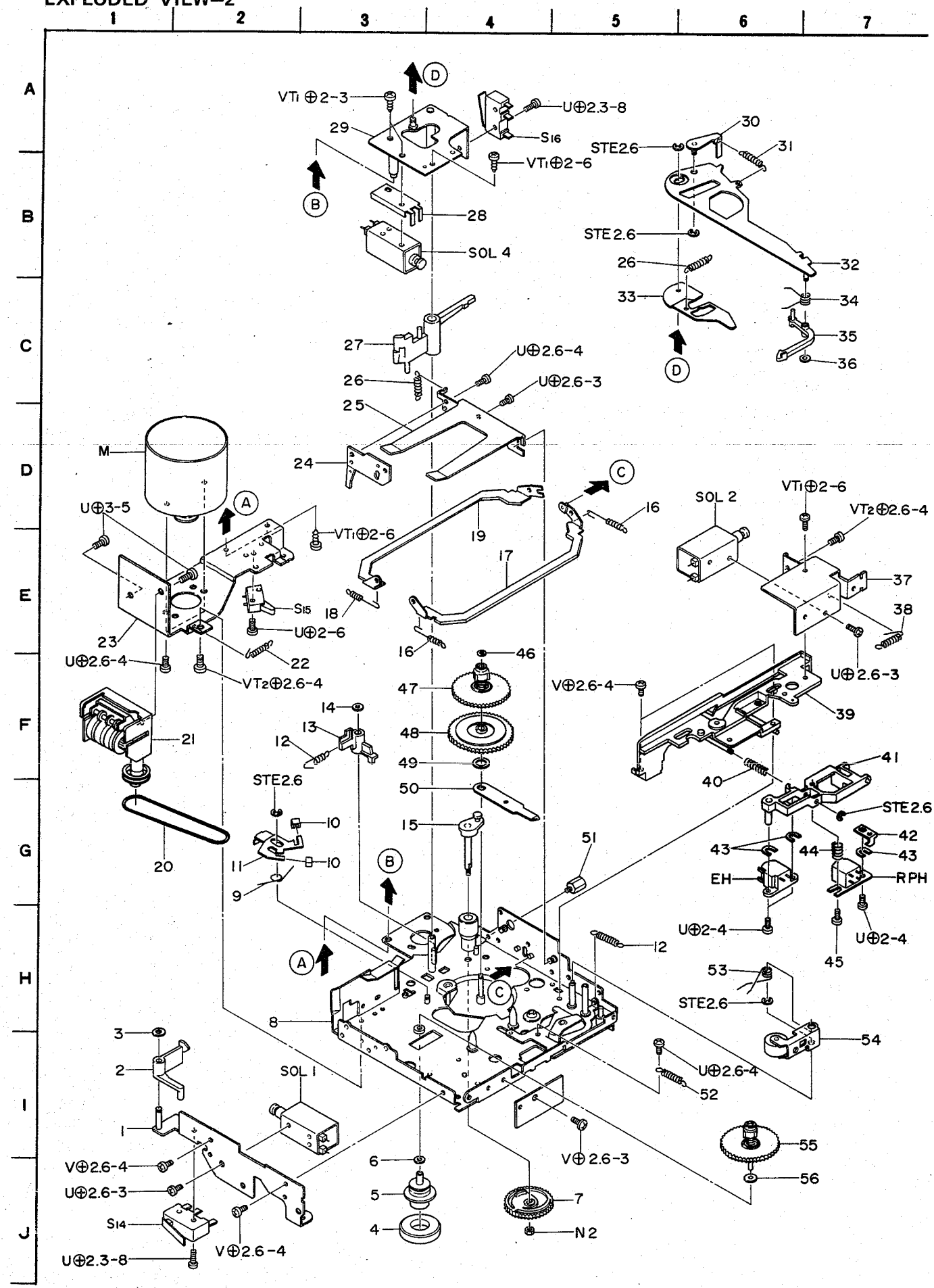
PARTS LIST

MECHANICAL PARTS

■ * mark in this part list shows exclusive part.

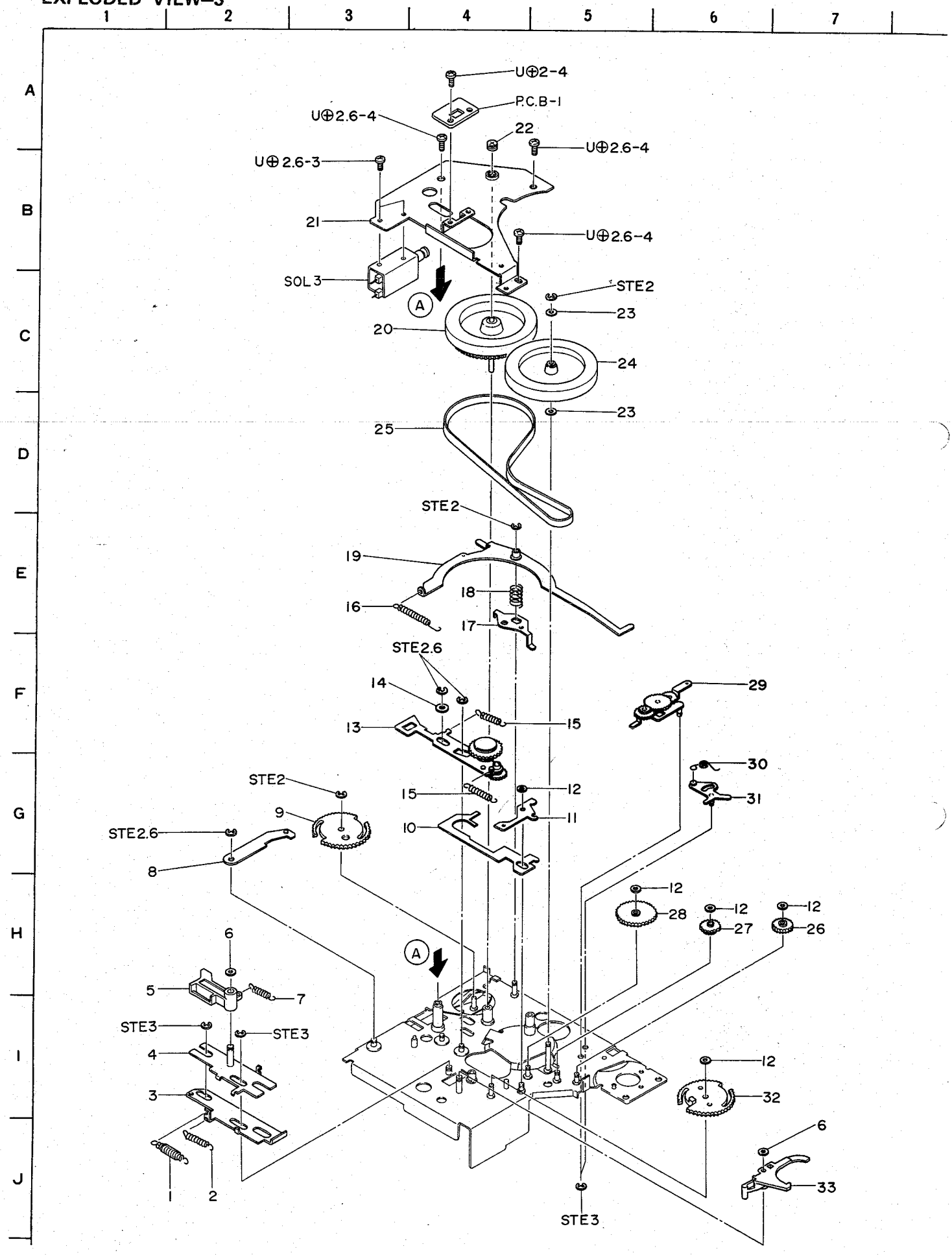
Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1-1	82-164-010-01		Knob, REC (UP)	SD-L30	1
1-2	82-164-011-01		Knob, REC (DOWN)	SD—L30	1
1-3	82-173-045-01		Panel, Front	*	1
1-4	82-748-003-01		Decorative plate, Volume knob	SA-C50	1
1-5	82-157-002-01		Guide, Bias lever		1
1-6	82-748-205-01		Guide, Switch	SA-C50	1
1-7	82-173-041-01		Guide, Eject button	*	1
1-8	82-173-040-01		Button, Eject	*	1
1-9	82-173-228-01		C-spring	*	1
1-10	82-173-038-01		Window, LED	*	1
1-11	82-745-012-01		Guide, Push-button C		1
1-12	82-173-226-01		Guide, RESET button	*	1
1-13	82-173-051-01		Guide, LED	*	1
1-14	82-157-001-01		Bias lever	SD-L50	2
1-15	82-745-019-01		Foot		4
1-16	82-745-008-01		Push-button A		3
1-17	82-745-003-01		Side panel L		2
1-18	87-084-077-01		Nylon rivet 3.5-4.5		7
1-19	82-173-222-01		Chassis, Front	*	
1-20	82-173-238-01		Holder, Switch	*	1
1-21	82-745-010-01		Push-button C		1
1-22	82-173-223-01		Holder, Mechanism	*	4
1-23	82-173-344-01		Button, RESET	*	1
1-24	82-173-237-01		Holder, Lamp	*	1
1-25	82-173-034-01		Cassette plate	*	1
1-26	87-038-039-01		Wire binder		1
1-27	82-173-042-01		Cabinet, Steel	*	1
1-28	82-173-043-01		Cleaning lid	*	1
1-29	82-570-662-01		Insulation sheet		1
1-30a	87-034-877-01		AC power cord (E model only)		1
1-30b	87-034-872-01		AC power cord (K model only)		1
1-31	87-085-166-01		Holder, AC power cord		1
1-32	87-084-063-01		Nylon rivet 3-5.5		2
1-33a	82-173-048-01		Jack plate (E model only)	*	1
1-33b	82-173-049-01		Jack plate (K model only)	*	1
1-34a	82-173-231-01		Chassis, Amp. (E model only)	*	1
1-34b	82-173-232-01		Chassis, Amp. (K model only)	*	1
1-35	82-755-221-01		G cushion	AX-S50	2
1-36	82-173-346-01		Earth plate ass'y	*	1
1-37	82-173-036-01		Push-button, REC	*	4
1-38	82-173-037-01		Push-button, PLAY	*	2
1-39	82-173-236-01		Shaft, Ehect	*	1
1-40	82-173-234-01		Lever, Eject	*	1
1-41	82-173-229-01		T-spring	*	1
1-42	82-173-224-01		Stopper	*	2
1-43	82-173-032-01		Cabinet, Front	*	1
1-44	82-173-033-01		Window, Cassette	*	1
1-45	87-033-161-01		Holder, fuse 1P		1
1-46	82-173-348-01		Cover, Insulation	*	1
1-47	87-085-080-01		Nylon rivet 3-3.5		1
1-48	82-499-209-11		Holder B, Fuse		1

EXPLODED VIEW–2



Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
2-1	82-173-261-01		FR solenoid bracket ass'y	*	1
2-2	82-173-260-01		REC arm	*	1
2-3	82-173-259-01		Washer, Lock B	*	1
2-4	82-173-283-01		Ring magnet	*	1
2-5	82-173-311-01		Pulley, Counter	*	1
2-6	82-173-310-01		Washer, PW B	*	1
2-7	82-173-318-01		Cam, Eject gear	*	1
2-8	82-173-276-01		Chassis base ass'y	*	1
2-9	82-173-296-01		T-spring, Brake	*	1
2-10	82-173-301-01		Brake pad	*	2
2-11	82-173-290-01		Bracket, Brake	*	1
2-12	82-173-274-01		E-spring G	*	2
2-13	82-173-273-01		Solenoid arm	*	1
2-14	82-173-271-01		Washer, Lock C	*	1
2-15	82-173-303-01		Shaft control ass'y	*	1
2-16	82-173-268-01		E-spring E	*	2
2-17	82-173-258-01		Pantagraph arm R	*	1
2-18	82-173-256-01		E-spring B	*	1
2-19	82-173-255-01		Pantagraph arm L	*	1
2-20	82-173-252-01		Belt, Counter	*	1
2-21	82-173-251-01		Counter	*	1
2-22	82-173-269-01		E-spring F	*	1
2-23	82-173-250-01		Bracket, Motor	*	1
2-24	82-173-254-01		Eject cam slider	*	1
2-25	82-173-253-01		Cassette push bracket	*	1
2-26	82-173-266-01		E-spring D	*	2
2-27	82-173-294-01		Push arm	*	1
2-28	82-173-288-01		P-spring, solenoid	*	1
2-29	82-173-243-01		Eject guide bracket ass'y	*	1
2-30	82-173-245-01		Eject switch bracket ass'y	*	1
2-31	82-173-244-01		E-spring A	*	1
2-32	82-173-246-01		Eject lever ass'y	*	1
2-33	82-173-267-01		Lever, Eject guide	*	1
2-34	82-173-291-01		T-spring, Arm lock	*	1
2-35	82-173-292-01		Cassette slider	*	1
2-36	82-173-257-01		Washer, Lock A	*	1
2-37	82-173-323-01		Paly solenoid bracket	*	1
2-38	82-173-324-01		E-spring K	*	1
2-39	82-173-304-01		Slider housing ass'y	*	1
2-40	82-173-305-01		C-spring, Head lock	*	1
2-41	82-173-316-01		Head block	*	1
2-42	82-173-326-01		Gracket, Head drive	*	1
2-43	82-173-329-01		Spacer, Head	*	3
2-44	82-173-331-01		C-spring, Azimuth	*	1
2-45	82-173-332-01		Azimuth screw	*	1
2-46	82-173-299-01		Washer, Lock D	*	1
2-47	82-173-300-01		Take-up reel gear ass'y	*	1
2-48	82-173-302-01		Clutch reel	*	1
2-49	82-173-306-01		Washer, PW A	*	1
2-50	82-173-307-01		P-spring, Torque limit	*	1
2-51	82-173-308-01		Stud, Circuit board	*	1
2-52	82-173-287-01		E-spring H	*	1
2-53	82-173-327-01		T-spring, Pinch roller	*	1
2-54	82-173-328-01		Pinch roller ass'y	*	1
2-55	82-173-293-01		Supply reel gear ass'y	*	1
2-56	82-173-295-01		Washer, STW A	*	1

EXPLODED VIEW–3



Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
3-1	82-173-264-01		E-spring, Play idler	*	1
3-2	82-173-263-01		E-spring C	*	1
3-3	82-173-284-01		Lever, FR B	*	1
3-4	82-173-285-01		Lever, FR A ass'y	*	1
3-5	82-173-286-01		FR guide arm	*	1
3-6	82-173-271-01		Waher, Lock C	*	2
3-7	82-173-287-01		E-spring H	*	1
3-8	82-173-321-01		FF bracket ass'y	*	1
3-9	82-173-339-01		Cam pause ass'y	*	1
3-10	82-173-280-01		Brake play lever	*	1
3-11	82-173-282-01		Assist bracket	*	1
3-12	82-173-257-01		Washer, Lock A	*	5
3-13	82-173-319-01		Clutch FF ass'y	*	1
3-14	82-173-306-01		Washer PW A	*	1
3-15	82-173-309-01		E-spring I	*	2
3-16	82-173-322-01		E-spring J	*	1
3-17	82-173-340-01		Lever, Pack detect	*	1
3-18	82-173-341-01		C-spring, Back tension	*	1
3-19	82-173-342-01		Play lever ass'y	*	1
3-20	82-173-343-01		Flywheel	*	1
3-21	82-173-275-01		Bracket, Flywheel	*	1
3-22	82-173-270-01		Thrust screw	*	1
3-23	82-173-312-01		Washer, STW B	*	2
3-24	82-173-315-01		Flywheel, Sub	*	1
3-25	82-173-265-01		Belt, Main	*	1
3-26	82-173-277-01		Gear A, Eject	*	1
3-27	82-173-278-01		Arm gear	*	1
3-28	82-173-279-01		Gear B, Eject	*	1
3-29	82-173-314-01		Arm gear ass'y	*	1
3-30	82-173-313-01		T-spring, Over center	*	1
3-31	82-173-320-01		Action lever ass'y	*	1
3-32	82-173-297-01		FR drive gear	*	1
3-33	82-173-298-01		FR lock arm	*	1

Circuit explanation

1. Logic Control

The BA843 I^2L IC is used for logic control. The desired mode can be mechanically controlled by reducing the input pins to a low voltage level (0 ~ 0.8V). When this happens, a high level voltage (2.9V min) is fed out from the output pins.

1-1. Outline drawing

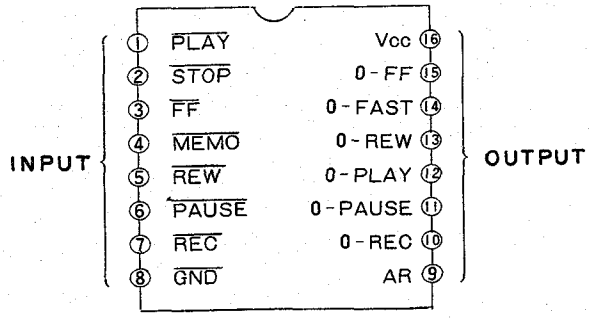


Fig. 1

4 MEMO is not used.

Pin No.	Name	Function
1	$\overline{\text{PLAY}}$	Input that commands tape playback and PAUSE release; recording starts when it is set to a low level simultaneously with REC.
2	$\overline{\text{STOP}}$	Input that commnads STOP.
3	$\overline{\text{FF}}$	Input that commands tape fast forwarding (F.FWD).
5	$\overline{\text{REW}}$	Input that commands tape rewinding (REW).
6	$\overline{\text{PAUSE}}$	Input that commands a pause in the tape travel; unit is set to the recording pause mode when it is set to a low level simultaneously with REC; the PLAY key is used to release the PAUSE mode.
7	$\overline{\text{REC}}$	Input that commands recording; effective only when set to a low level simultaneously with PLAY and PAUSE.
8	GND	Ground pin
9	AR	Recording is inhibited by keeping this pin at a low level. It is reduced to a low level with the accidental erasure prevention tab detector switch.
10	0-REC	High level output in the recording or recording pause mode.
11	0-PAUSE	High level output in the pause or recording pause mode.
12	0-PLAY	High level output in the playback or recording mode.
13	0-REW	High level output in the rewinding mode.
14	0-FAST	High level output in the fast forwarding or rewinding mode.
15	0-FF	High level output in the fast forwarding mode.
16	Vcc	Supply voltage pin

1-2. Input operations

Input signal		$\overline{\text{STOP}}$	$\overline{\text{FF}}$	$\overline{\text{REW}}$	$\overline{\text{PLAY}}$	$\overline{\text{PAUSE}}$	$\overline{\text{REC/PLAY}}$	$\overline{\text{REC/PAUSE}}$	$\overline{\text{AR}}$
Output	0-FAST	L	H	H	L	L	L	L	REC INH.
	0-FF	L	H	L	L	L	L	L	
	0-REW	L	L	H	L	L	L	L	
	0-REC	L	L	L	L	L	H	H	
	0-PLAY	L	L	L	L	H	L	H	
	0-PAUSE	L	L	L	H	L	H	L	
Output mode		STOP mode	FF mode	REW mode	PLAY mode	PAUSE mode	REC/PLAY mode	REC/PAUSE mode	

1-3. Output mode operatios

Output mode with multiple entry		STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PAUSE
Input signal	$\overline{\text{STOP}}$	*	STOP	STOP	STOP	STOP	STOP	STOP
	$\overline{\text{FF}}$	FF	*	FF	FF	FF	FF	FF
	$\overline{\text{REW}}$	REW	REW	*	REW	REW	REW	REW
	$\overline{\text{PLAY}}$	PLAY	PLAY	PLAY	*	PLAY	*	REC/PLAY
	$\overline{\text{PAUSE}}$	PAUSE	*	*	PAUSE	*	PAUSE	*
	$\overline{\text{REC/PLAY}}$	REC/PLAY	REC/PLAY	REC/PLAY	REC/PLAY	REC/PAUSE	*	REC/PLAY
	$\overline{\text{REC/PAUSE}}$	REC/PAUSE	*	*	REC/PAUSE	REC/PAUSE	REC/PAUSE	*
	$\overline{\text{MEMO}}$	*	*	STOP	*	*	*	*
	$\overline{\text{AR}}$	*	*	*	*	*	PLAY	PAUSE

* indicates that there is no change in the output mode.

1-4. Output modes with multiple entry

Input signal A	Input signal B	Output mode
$\overline{\text{STOP}}$	$\overline{\text{FF}}$, $\overline{\text{REW}}$, $\overline{\text{REC}}$, $\overline{\text{PAUSE}}$, $\overline{\text{PLAY}}$	STOP
$\overline{\text{FF}}$	$\overline{\text{REW}}$, $\overline{\text{PLAY}}$	STOP
	$\overline{\text{REC}}$, $\overline{\text{PAUSE}}$	FF
$\overline{\text{REW}}$	$\overline{\text{REC}}$, $\overline{\text{PAUSE}}$	REW
	$\overline{\text{PLAY}}$	STOP
$\overline{\text{REC}}$	$\overline{\text{PAUSE}}$	REC/PAUSE
	$\overline{\text{PLAY}}$	REC/PLAY
	$\overline{\text{PAUSE}}$ & $\overline{\text{PLAY}}$	REC/PAUSE
$\overline{\text{PAUSE}}$	$\overline{\text{PLAY}}$	PAUSE

2. Description of Logic Circuitry Operations

2-1. Loading

- Since the cassette loading PACK IN switch goes to "ON" and the PACK DOWN switch goes to OFF, Q3 goes to ON and the STOP mode is established. Meanwhile, differentiation occurs at C10, Q13 goes ON and the EJECT solenoid is momentarily attracted.
- When C11 is charged through D19 and R32, Q15 goes ON, Q14 goes ON and the motor starts rotating.
- When the cassette is loaded, the PACK DOWN switch goes ON.

2-2. PLAY operation

- The 0-PLAY pin is set to a high level, Q7 goes ON, Q12 goes ON, the PLAY solenoid is attracted and the PLAY mode is established (LOGIC OUT PLAY at high level).

2-3. REC operation

- The mechanism operation is the same as with PLAY; the LOGIC OUT REC is fed out at a low level.

2-4. REW operation

- The O-REW pin is set to the high level, Q6 goes ON, Q11 goes ON and the F/R solenoid is attracted.

2-5. FF operation

- The 0-FF pin is set to the high level, Q6 goes ON, Q11 goes ON and the F/R solenoid is attracted. Meanwhile, differentiation occurs at C4, Q5 goes ON, Q10 goes ON and the FF solenoid is momentarily attracted.

2-6. Timer standby operation

Timer recording or playback is made operational by reducing the recording or playback logic input pin, selected by the timer standby switch, to a low level by the timer start transistor (Q1).

When the voltage exceeds the preset value, the current is reduced by the λ diode so that it is completely cut off. This is because of the lambda-type negative resistance characteristics.

- The waveform differentiated by C1 is applied to D20, D20 goes ON with the D20 (lambda diode) valley voltage, Q1 goes ON, the PLAY pin or the PLAY and REC pins are set to the low level, and timer standby starts.

D20 anode voltage waveform

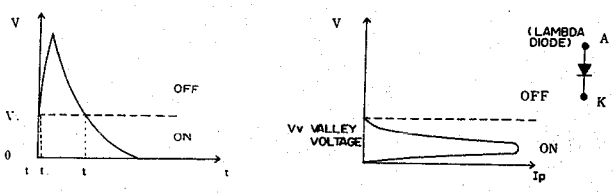


Fig. 2

D20 is turned ON by its lambda characteristics while its anode voltage goes from zero to Vv ($t_0 \sim t_1$) and it is turned OFF when the Vv value is exceeded. The voltage is equivalent to Vv at ($t_1 \sim t_2$)t_2 and so the diode is turned ON again.

t_2 is the timer standby time.

The diode also turns ON during $t_0 \sim t_1$ but since the capacitor at the base of Q1 is charged and the time is short, Q1 is not actually turned ON.

2-7. Pause operation

- 0-PAUSE pin is set to the high level and so Q8 goes ON, and the LOGIC OUT and PAUSE signals are fed out.

2-8. $\overline{AR}$ operation

- Recording is inhibited (accidential erasure prevention) when the REC INH switch is at ON (AR is at the low level).

2-9. EJECT operation

- The EJECT SWITCH is set to ON, differentiation occurs at C10, Q13 goes ON, the EJECT solenois is momentarily attracted and the EJECT operation starts.

  During the EJECT operation the PACK IN switch goes OFF, and Q15 remains ON until C11 discharges so hat Q14 goes ON and a voltage is applied to the motor, resulting in the cassette being pushed out.
- The STOP mode is established when the EJECT switch is at ON, and so ejection is possible without going through the STOP mode.

3. Recording/Playback Selector Circuit

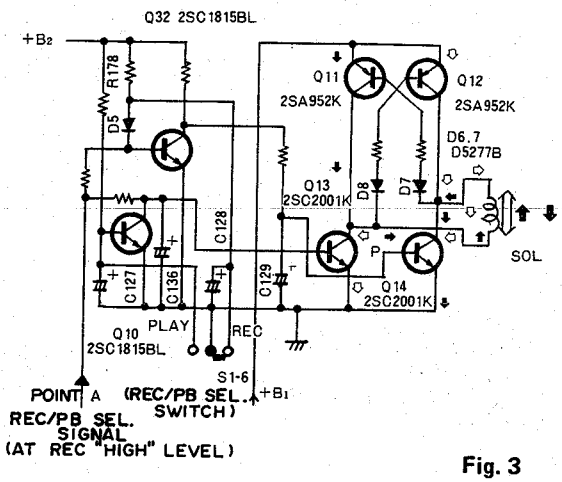


Fig. 3

3-1. Initial setting

When the power is switched on when the rec/pb selector switch (S1-6) is at REC, the Q32 base bias is such that the midpoint between R178 and D5 is grounded. This means that Q32 goes OFF, Q14 goes ON, Q11 goes ON, the solenoid is attracted to the side marked with an arrow↑, and S1 is set to PLAY(kept here by the magnet). When the power is switched on, the PLAY mode is always established, C128 is charged, Q32 goes ON, Q14 goes OFF and Q11 goes OFF. When the same switch is at REC, C127 charges, Q10 goes ON, Q13 goes OFF, Q12 goes OFF, and when the switch is set to PLAY, Q10 goes OFF but since point A is at the low level, Q13 goes OFF and Q12 goes OFF.

When the power is switched on with the rec/pb selector switch (S1-6) at PLAY, C128 charges, Q32 goes ON, Q14 goes OFF and Q11 goes OFF. (The rec/pb selector switch is kept at the PLAY position.)

3-2. Operation during recording

When the REC mode is established, point A goes to the high level, Q32 goes ON, Q14 goes OFF and Q11 goes OFF.

Meanwhile, Q10 goes OFF, Q13 goes ON, Q12 goes ON, the solenoid is attracted in the direction marked with the arrow↓, S1 goes to the REC position and it is kept here by the magnet. As a result, C127 is charged, Q10 goes ON, Q13 goes OFF and Q12 goes OFF. (No current runs to the solenoid when the rec/pb selector switch changes position.) C127 serves to delay the time during which Q10 goes ON and C136 prolongs the time during which Q13 is ON.

3-3. Recording mode release

When the recording mode is released, point A is set to a low level, Q32 goes OFF, Q14 goes ON, Q11 goes ON, the solenoid is attracted to the side marked with an arrow↑, and S1 changes to the PLAY position. As a result, C128 is charged, C32 goes ON, Q14 goes OFF and Q11 goes OFF.

Meanwhile, when the same switch is at REC, Q10 goes ON, Q13 goes OFF and Q12 goes OFF. When the switch is changed to the PLAY position, Q10 goes OFF but since point A goes to the low level, Q13 goes OFF and Q12 goes OFF.

C128 serves to delay the time during which Q32 is turned OFF while C129 prolongs the time during which Q14 is ON.

4. Muting Circuit

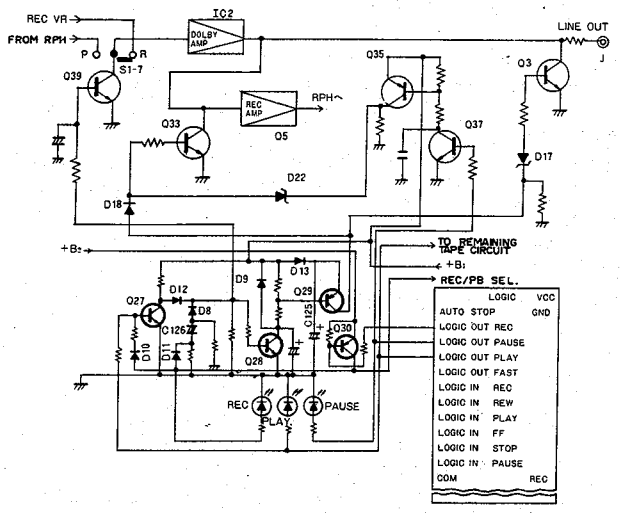


Fig. 4

4-1. STOP operation

- The voltage from +B1 is applied via D12, Q39 goes ON and the muting takes effect.
- Q28 goes ON, Q29 goes ON, Q33 goes ON, Q3 goes ON, and the muting takes effect.

4-2. PLAY operation

- The LOGIC OUT PLAY goes to a high level, Q27 goes ON, Q3 goes OFF and the muting effect is released.

→Q28 goes OFF, Q29 goes OFF, Q33 goes OFF, Q3 goes OFF and the muting effect is released.

4-3. REC, PLAY operations

- The LOGIC OUT REC goes to a low level, Q30 goes ON, and the signal is fed out to the Q30 collector. The signal is differentiated by D11 and C126 in the rec/pb selector circuit and, via D8, Q39 goes ON and Q28 goes ON, Q29 goes ON.
  The muting takes effect momentarily and then it is released with the output from LOGIC OUT PLAY.

4-4. REC, PAUSE operations

- The LOGIC OUT REC goes to a low level and muting takes effect momentarily as with REC PLAY operations. Meanwhile, Q27 goes ON via D10 with the output from Q30 and the muting effect is released.
- The LOGIC OUT PAUSE goes to a high level, Q37 goes ON, Q35 goes ON, Q33 goes ON and as a result the muting takes effect only with the signal applied to the rec amplifier. (This enables the recording to be monitored.)

4-5. Power OFF operation

- The potential of the Q29 base falls more rapidly than that of the emitter due to D13 and so the transistor goes ON, the charge stored in C125 is applied to Q33 and Q3, and the muting takes effect.

5. Music Sensor Circuit

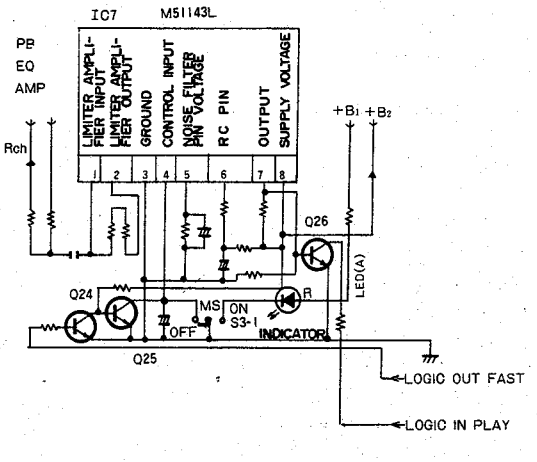


Fig. 5

The music sensor does not work when control input pin 4 is shorted to ground. It works only when S3-1 is ON and the LOGIC OUT FAST is at the high level (during fast forwarding and rewinding).

Timing chart

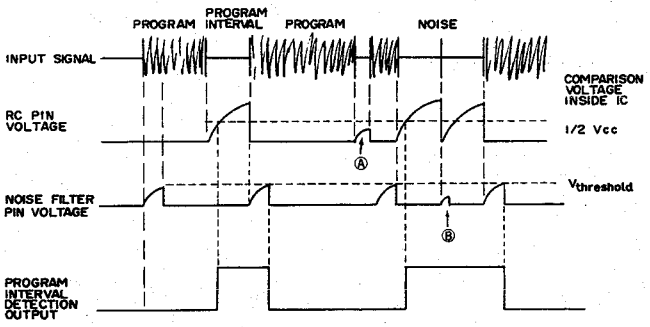


Fig. 6

Point A is where the unrecorded blank detection time is too short and there is no detection. Point B is where noise is detected but since the time is too short, the level does not rise to Vthreshold and so a program is not discriminated. Any unrecorded blanks lasting from 1.07 to 2.43 sec. are discriminated as intervals between programs.

Notes

When the FF → REW or REW → FF direct change is done with the music sensor switch set to "ON", the stop time during the direct change is counted as a music intermission and the unit may enter the PLAY mode because the LOGIC OUT FAST remains set to high level; this is not a malfunction.

6. Sync Rate Operation

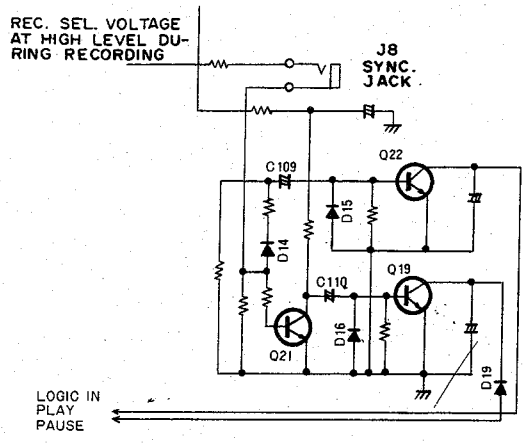


Fig. 7

6-1. When the arm descends in the REC, PAUSE mode:

Q21 goes ON, differentiation occurs at C109, Q22 goes ON momentarily and the REC PLAY mode is established.

6-2. When the arm rises in the REC PLAY mode:

Q21 goes OFF, differentiation occurs at C110, Q19 goes ON momentarily, and the REC PAUSE mode is established.

Note:

The PAUSE indicating LED may light when the deck is stopped during sync rate recording. If this happens, either depress the STOP button again or release the pause mode by operating another button.

7. Remaining Tape Detector Circuit

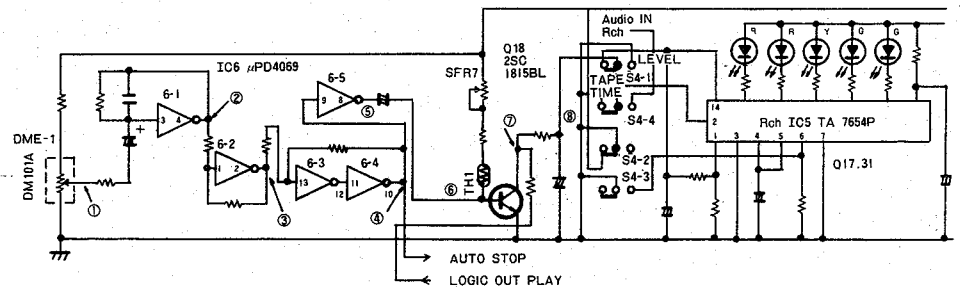


Fig. 8

8. Auto Stop Circuit

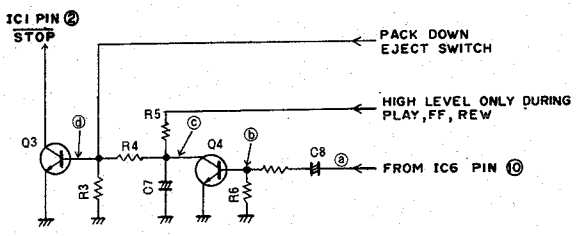


Fig. 10

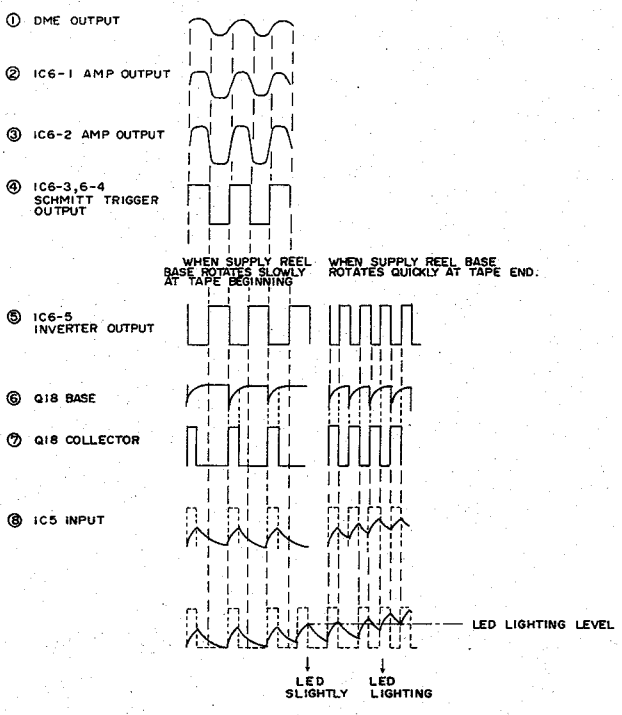

① DME OUTPUT
② IC6-1 AMP OUTPUT
③ IC6-2 AMP OUTPUT
④ IC6-3,6-4 SCHMITT TRIGGER OUTPUT
WHEN SUPPLY REEL BASE ROTATES SLOWLY AT TAPE BEGINNING
WHEN SUPPLY REEL BASE ROTATES QUICKLY AT TAPE END.
⑤ IC6-5 INVERTER OUTPUT
⑥ Q18 BASE
⑦ Q18 COLLECTOR
⑧ IC5 INPUT
LED LIGHTING LEVEL
LED SLIGHTLY
LED LIGHTING

Fig. 9

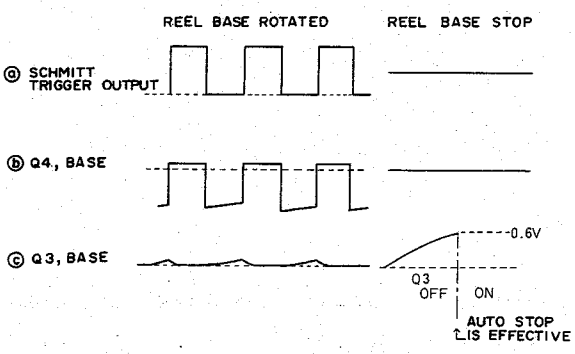


Fig. 11

ACCESSORIES/PACKAGE

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty	
1	82-173-853-01		Printed indiv., Packing	*	1	
2	82-748-856-11		Cushion L, Printed indiv.	SA-C50	1	
3	82-748-857-21		Cushion R, Printed indiv.	SA-C50	1	
4	87-051-135-11		Poly-vinyl sack		1	
5	87-056-604-01		Poly-vinyl sack		1	
6a	82-173-907-11		Instructions booklet (E model only)	*	1	
6b	82-173-908-01		Instructions booklet (K model only)	*	1	
7	87-051-171-11		Poly-vinyl sack		1	
8	87-056-009-41		Distributors list		1	
9	86-944-016-01		Connection cord CW-129DSK		2	
10	87-056-008-11		Label, AC power cord (K model only)		1	

AIWA CO., LTD.

Printed in Japan

NOTES (1) B(+) Pattern Others pattern
(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.
An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.

WIRING

3. Playback Level Adjustment
Settings:
- Test tape: TTA-161
- TAPE SELECTOR switch: CrO_2
- Adjustment locations: SFR1 (L-ch), SFR2 (R-ch)

Method:
Playback the test tape and adjust so that the LINE output is 580 mV.

2. Playback Frequency Characteristic Adjustment
Settings:
- Test tape: TTA-117E
- TAPE SELECTOR switch: CrO_2
- Adjustment locations: JMP1 (L-ch), JMP2 (R-ch)

Method:
Playback the test tape and adjust so that the 1 kHz and 10 kHz outputs are identical.
Rating:
0 ± 1 dB

6. REC./PB. Frequency Characteristic Adjustment
■ **CrO_2 tape**
Settings:
- Recording mode
- Test tape: TTA-119G
- Input signal: 1 kHz, 30mV
- TAPE SELECTOR switch: CrO_2
- Adjustment locations: SFR5 (L-ch), SFR6 (R-ch)

Method:
Supply a 1 kHz, 30mV signal and adjust the recording level so that the LINE OUTPUT is made 41mV.
Record and playback the 1kHz and 10kHz signals and adjust so that the 1kHz and 10kHz outputs are set to 0 ± 0.5 dB.

Settings differ as below LH, METAL
■ **LH tape** (Test tape: TTA-119J)
Rating:
0 ± 0.5 dB
■ **METAL tape** (Test tape: TTA-119M)
Rating:
0 ± 0.5 dB

5. Bias Trap Coil Adjustment
Settings:
- Recording mode
- REC VOLUME: MIN
- Test points: TP3 (L-ch), TP4 (R-ch)
- Adjustment locations: L1 (L-ch), L2 (R-ch)

Method:
Adjust L1,2 so that the voltage at test point TP1,2 is reduced to minimum value. Bias OSC frequency become 85 ± 5 kHz.

7. REC./PB. Sensitivity Adjustment
■ **CrO_2 tape**
Settings:
- Adjustment locations: SFR3 (L-ch), SFR4 (R-ch)

* For others, proceed as for 6, REC./PB. Frequency Characteristic Adjustment.
Method:
Record and playback the test tape and adjust so that the LINE OUTPUT becomes 41 mV.
Rating:
41 ± 2mV

■ **LH tape** (Test tape: TTA-119J)
Rating:
41 ± 5 mV
■ **METAL tape** (Test tape: TTA-119M)
Rating:
41 ± 5 mV

4. Adjusting Residual Amount of Tape
Settings:
- Test tape: C-60
- METER switch: TAPE TIME
- Adjustment locations: IC6 pins (8), (9) SFR7
- Test points: TP1, TP2

Method:
Check that the waveform of TP1 is L = H or L > H in the PLAY mode. Short-circuit IC6 pins (8) and (9) when L > H. (See figure 1)
Next, playback C60 from the start, stop it 4 minutes later and turn over it. Playback this tape and adjust SFR7 so that the waveform of TP2 is L:H = 4:1 at the position 4 minutes ± 15 sec from the tape end.

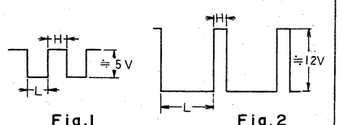


Fig.1

Fig.2

J1,2 LINE IN REC J3,4 LINE OUT PLAY

K SYNCRATE C.B
J8 PLAYER SYNC

B SUB C.B J5 L — MIC — R J6

A MAIN C.B

TP1 DME Test Point-1

PEAK (dB) -10 5 0 3 5
TAPE TIME C-60 C-90 (MINITES) 20 30 12 18 8 12 3 4.5

E LED-I C.B

DOLBY-NR

D1 D3 D5 D7 D9
D2 D4 D6 D8 D10
LEFT
RIGHT

D LED INDICATOR C.B

DME C.B
DME

D LED INDICATOR C.B

TP2 DME Test Point-2
S4 METER
TAPE TIME ↓ PEAK
S2 ON ↕ OFF DOLBY-NR

TP4 Bias Trap Test Point (R-ch)
TP3 Bias Trap Test Point (L-ch)
VR1 REC LEVEL L-⊙-R
S5 TAPE
METAL

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

J1,2 LINE IN REC J3,4 LINE OUT PLAY J7 REMOTE (TO REMOTE UNITE)

A MAIN C.B

AC OUTLET C.B (E model)

J9 AC OUTLET

AC 220V 50 / 60Hz

T.F

S18 POWER

C LOGIC C.B

CON ②

SOL1 (FF/REW)

S14 (REC INH)

SOL2 (PLAY)

SOL3 (F.FWD)

S17 (RESET)

CON ① ⇨ C LOGIC C.B

C LOGIC C.B CON ③

C LOGIC C.B CON ④

S15 (PACK DOWN)

SOL4 (EJECT)

S16 (PACK IN)

PL1

AC OUTLET C.B (K model)

J9 AC OUTLET

120V 220V 240V

AC 240V 50 / 60Hz

S18 POWER

RPH

EH

CP1 (BIAS OSC UNIT)

F1 T1.6A

SFR1 SFR2 SFR3 SFR4 SFR5 SFR6

S5 TAPE S6 TIMER

S13 EJECT

E EJECT C.B

M

MECHA C.B

D MECHA C.B

F LED-2 C.B

POWER

C LOGIC C.B

(SHIELD PLATE EARTH)

RECORD S7 REWIND S8 PLAY S9 F.FWD S10 STOP S11 PAUSE S12

G KEY SWITCH C.B

CON ⑤ ⇨ A MAIN C.B

1. Azimuth Adjustment

Settings:

- Playback mode
- Test tape: TTA-117E
- TAPE SELECTOR switch: CrO_2
- Adjustment location: azimuth adjusting screw

Method:

Playback the test tape and adjust so that the output of the 10 kHz section reaches the maximum and same phase for both the left and right channel.

AIWA

ELECTRICAL MAIN PARTS LIST

Symbol No.	Part No.	Description
≪MAIN CIRCUIT BOARD SECTION≫		
PCB-A	*	Main circuit board
IC1	87-027-761-01	IC, AN7310
IC2	87-027-754-01	IC, LM1111C
Q1~6,15, 33,34,39, 40,41	89-318-156-01	Transistor, 2SC1815(BL)
Q9,14	89-320-011-01	Transistor, 2SC2001 (K)
Q11,12	89-109-521-01	Transistor, 2SA952 (K)
Q16	89-408-805-01	Transistor, 2SD880 (GR)
D1	87-027-782-01	Zener diode, 05Z11Y
D6,7,21,22, 23,24,25	87-027-365-01	Diode, S5277B
D19	87-027-097-01	Diode, 1S1555
L1,2	87-005-127-01	Coil, 22mH
L3,4	87-005-090-01	Micro inductor coil, 2.7mH
L5	82-401-661-01	Choke coil, 600μH
MPX1,2	87-008-230-01	MPX filter
J1,2,3,4	87-049-055-01	Pin jack, 4P (LINE IN, LINE-OUT)
J7	87-032-985-01	Din socket, 8P (REMOTE)
VR1	82-173-618-01	Volume, 50kΩ-A (REC LEVEL)
CP1	82-173-619-01	OSC unit
S1	82-173-620-01	Slide switch (REC/PB)
S5	87-031-626-01	Lever switch (TAPE SELECTOR)
S6	87-031-625-01	Lever switch (TIMER)
SFR1,2	87-021-574-01	Semi-fixed resistor, 30kΩ-B
SFR3,4	87-021-568-01	Semi-fixed resistor, 20kΩ-B
SFR5,6	87-021-570-01	Semi-fixed resistor, 100kΩ-B
⚠F1	87-035-224-01	Fuse, "T", 1.6A
	87-098-081-01	Fuse label "T" 1.6A
⚠	87-033-147-01	Fuse clamp
PIN-5	87-049-039-01	Pin, 9P
		< Resistors >
R141	87-025-194-01	220Ω 2W Metal film
⚠R95	87-029-010-01	10Ω ¼w Fuse resistor
⚠R96	87-029-007-01	22Ω ¼w Fuse resistor
		< Capacitors >
C19	87-015-241-81	1μF 50V Electrolytic LL
C5,6	87-015-246-81	4.7μF 25V Electrolytic LL
C57,58	87-014-037-01	150pF PP
≪SUB CIRCUIT BOARD SECTION≫		
PCB-B	*	Sub circuit board
IC3	87-027-754-01	IC, LM1111C
Q7,8,10, 27,28,32	89-318-156-01	Transistor, 2SC1815 (BL)
Q13	89-320-011-01	Transistor, 2SC2001 (K)
Q19,21,22	89-318-155-01	Transistor, 2SC1815 (GR)
Q29,30	89-107-335-01	Transistor, 2SA733 (K)
D3	87-027-508-01	Zener diode, HZ-151
D5,8,9,10, 11,12,13,14 15,16,18	87-027-097-01	Diode, 1S1555
D17	87-027-286-01	Zener diode, HZ5C1
D20	87-027-782-01	Zener diode, 05Z11Y
J5,6	87-049-047-01	Jack, 6.3φ (MIC L,R)
		< Capacitor >
C20	87-015-241-81	1μF 50V Electrolytic LL

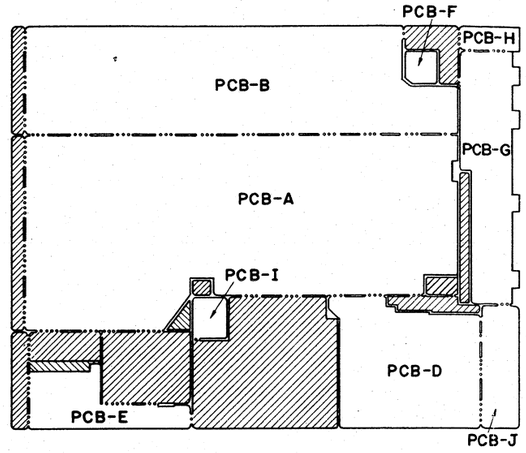
Symbol No.	Part No.	Description
≪LOGIC CIRCUIT BOARD SECTION≫		
PCB-C	82-173-325-21	Logic circuit board ass'y
IC1	82-173-646-01	IC, BA843
Q1,3,4,5,6, 8,9,15	89-309-455-01	Transistor, 2SC945L (Q)
Q2,11,12	82-173-647-01	Transistor, 2SC1318NC (R)
Q7	89-406-555-01	Transistor, 2SD655 (E)
Q10,13	89-313-830-01	Transistor, 2SC1383
Q14	89-106-834-51	Transistor, 2SA683 (R,S)
D1,2,3,5,6, 7,8,9,10, 11,15,16,19 23,25	87-027-097-01	Diode, 1S1555
D4	87-027-332-01	Zener diode, HZ6B-1L
D12,13,14, 18,21	82-173-649-01	Diode, DS135D
D20	82-173-648-01	Diode, MA522
D22	82-173-650-01	Zener diode, HZ9C-2L
F3	87-035-218-01	Fuse, "T" 400mA
	87-098-012-01	Fuse label, "T" 400mA
PIN-1	87-049-039-01	Pin, 9P
PIN-2	82-173-652-01	Pin, 4P
PIN-3	82-173-654-01	Pin, 6P
PIN-4	82-173-653-01	Pin, 5P
PIN	82-173-655-01	Pin, 9P
		< Resistor >
⚠R9	87-029-010-01	10Ω ¼w Fuse resistor
≪LED INDICATOR CIRCUIT BOARD SECTION≫		
PCB-D	*	LED indicator circuit board
IC4,5	87-027-698-01	IC, TA7654
IC6	87-027-538-01	IC, μPD4069
Q18,31	89-318-156-01	Transistor, 2SC1815 (BL)
D2	87-027-625-01	Zener diode, 05Z6.8U
TH1	82-304-722-01	Termistor, 42D26 (E model only)
S2	87-031-507-01	Push-switch (DOLBY-NR)
S4	87-031-634-01	Push-switch (METER)
SFR7	87-021-572-01	Semi-fixed resistor, 500kΩ-B
		< Resistor >
R97	87-025-194-01	220Ω 2W Metal film
≪LED-1 CIRCUIT BOARD SECTION≫		
PCB-E	*	LED-1 circuit board
D1,2,3,4	87-027-731-01	LED, SR-535D
D5,6	87-027-733-01	LED, SY-435
D7,8,9,10	87-027-732-01	LED, SG-235D
≪LED-2 CIRCUIT BOARD SECTION≫		
PCB-F	*	LED-2 circuit board
D1	87-027-543-01	LED, LN317GP
≪KEY-SWITCH CIRCUIT BOARD SECTION≫		
PCB-G	*	Key-switch circuit board
D1	87-027-646-01	LED, SEL1112R
D2	87-027-648-01	LED, SEL1331G
D3	87-027-647-01	LED, SEL1941D
S7,8,9,10, 11,12	87-031-627-01	Tact switch (RECORD, REWIND, PLAY, FF, STOP, PAUSE)
≪EJECT CIRCUIT BOARD SECTION≫		
PCB-H	*	Eject circuit board
S13	87-031-627-01	Tact switch (EJECT)

Symbol No.	Part No.	Description
≪DME CIRCUIT BOARD SECTION≫		
PCB-I	*	DME circuit board
DME1	82-397-642-11	DM-101A
≪MECHANISM CIRCUIT BOARD SECTION≫		
PCB-J	*	Mechanism circuit board
		< Resistor >
⚠R190	87-029-010-01	10Ω ¼W Fuse resistor
≪SYNCRATE CIRCUIT BOARD SECTION≫		
PCB-K	82-173-628-01	Syncrate circuit board
Q35	89-107-335-01	Transistor, 2SA733 (K)
Q37	89-318-155-01	Transistor, 2SC1815 (GR)
J8	87-049-006-01	Jack ass'y, 2.5φ (PLAYER SYNC)
≪AC OUTLET CIRCUIT BOARD SECTION≫		
⚠ PCB-L	82-173-617-11	AC outlet circuit board (E model only)
⚠ PCB-L	82-173-627-11	AC outlet circuit board (K model only)
⚠ J9	87-049-014-01	AC outlet (E model only)
⚠ J9	87-032-996-01	AC outlet (K model only)
⚠ F2	87-035-224-01	Fuse, "T" 1.6A (E model only)
	87-098-081-01	Fuse label, "T" 1.6A (E model only)
⚠	87-033-147-01	Fuse clamp (E model only)
≪MISCELLANEOUS≫		
⚠T1	82-173-615-01	Power transformer (E model only)
⚠T1	82-173-616-01	Power transformer (K model only)
RPH	82-173-330-01	REC/PB head
EH	82-173-317-01	Erase head
M	82-173-247-01	Motor ass'y
PL1	82-173-621-01	Pilot lamp
SOL1,2	82-173-281-01	Solenoid ass'y (FF/REW, PLAY)
SOL3,4	82-173-289-01	Solenoid ass'y (FF, EJECT)
S14	82-173-262-01	Micro switch (REC INH)
S15	82-173-272-01	Micro switch (CASSETTE DOWN)
S16	82-173-242-01	Micro switch (CASSETTE IN)
S17	87-031-493-01	Micro swtich (RESET)
⚠S18	87-031-552-01	Push-switch (POWER)
⚠	87-034-877-01	AC power cord (E model only)
⚠	87-034-872-01	AC power cord (K model only)
	87-085-166-01	Holder, AC power cord
CON-2	82-173-338-01	Connector ass'y, 4P
CON-4	82-173-337-01	Connector ass'y, 5P
CON-3	82-173-336-01	Connector ass'y, 6P
CON-5	82-173-622-11	Connector ass'y, 9P
CON-1	82-173-623-01	Connector ass'y, 9P
		< Capacitors >
⚠ C1	87-019-105-01	0.02μF Spark killer

⚠ Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

Note; Combination Circuit Board
The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

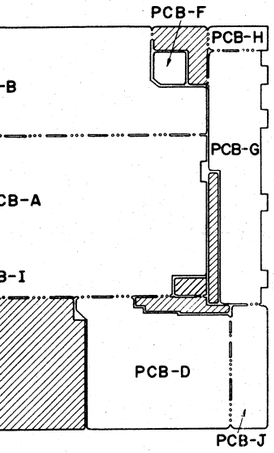
Combination circuit board 82-173-601-11



oard

ts list which are indicated by an
ne single combined circuit board.
pplied separately. If this becomes
circuit board.

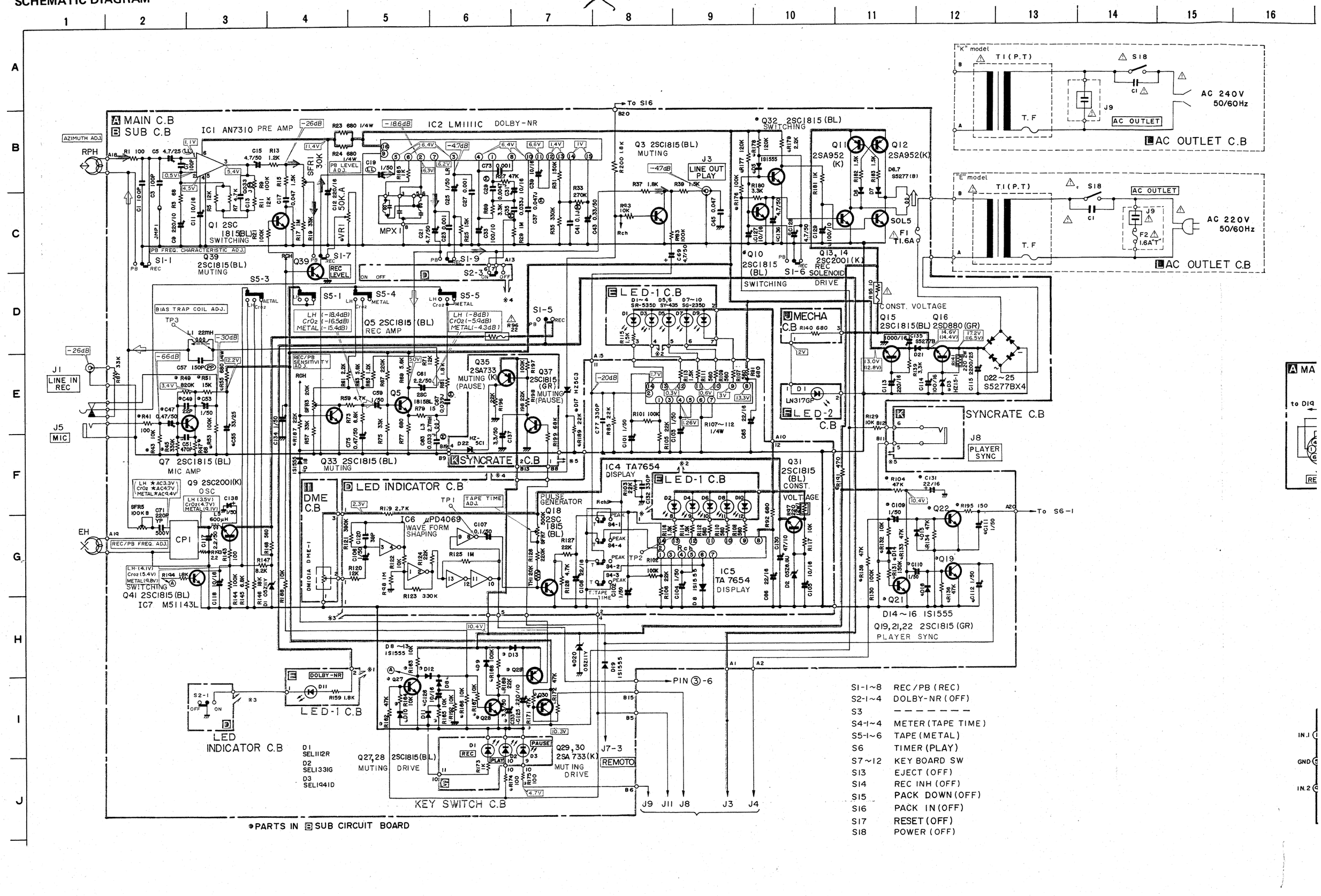
-173-601-11



MEMO

SD-L60E,K SD-L60E,K

SCHEMATIC DIAGRAM



S1-1~8	REC/PB (REC)
S2-1~4	DOLBY-NR (OFF)
S3	– – – – – – – –
S4-1~4	METER (TAPE TIME)
S5-1~6	TAPE (METAL)
S6	TIMER (PLAY)
S7~12	KEY BOARD SW
S13	EJECT (OFF)
S14	REC INH (OFF)
S15	PACK DOWN (OFF)
S16	PACK IN (OFF)
S17	RESET (OFF)
S18	POWER (OFF)

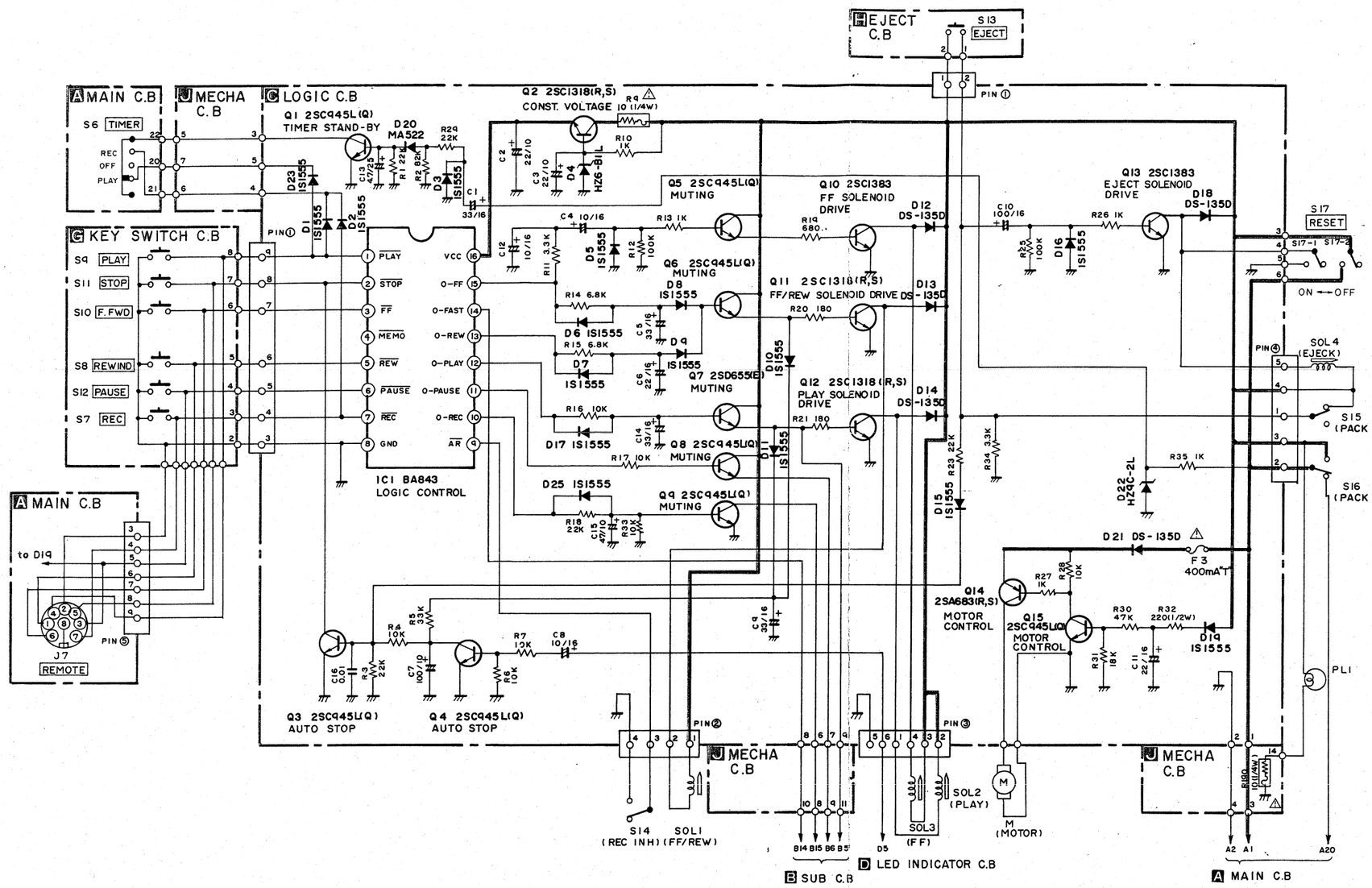
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

AC 240V 50/60Hz

AC OUTLET C.B

AC 220V 50/60Hz

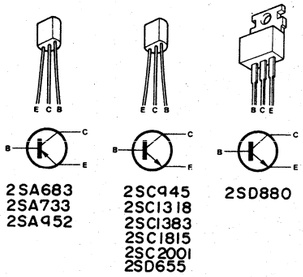
AC OUTLET C.B



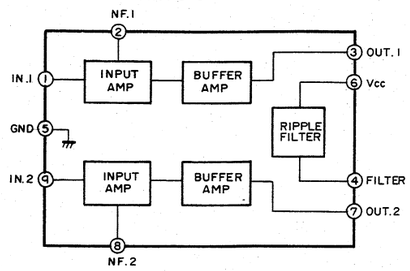
NOTES:

1) ▬ B (+) power supply
2) ➡ Signal path
   ⇨ Rec signal path.
3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
   But ( ) is with recording.
   An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
4) Resistors with no designation have a rated power of ¼W and a tolerance of ±5%.
5) Capacitors with no designation have a dielectric strength of less than 50WV.
6) The only capacitor tolerances indicated are ±5% (J) and ±10% (K).
7) Ceramic capacitor symbols:
   ⊣|(- High dielectric constant system (YY)
   ⊣|⊢ High dielectric constant system (YW, YP, YZ)
8) Explanation of symbols
   (M) Mylar capacitor
   (PP) Polypropylene film capacitor
   (LL) Low-leakage capacitor
   ⏦ Fuse resistor
   ⚠ Safety component symbol
   This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

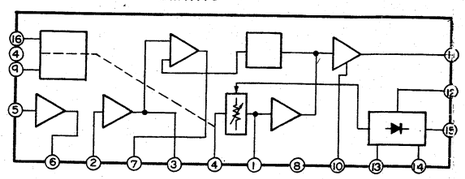
- This schematic diagram is subject to change without notice in the interests of improved performance.



IC1
AN7310



IC2,3
LM1111C



IC7
M51143L